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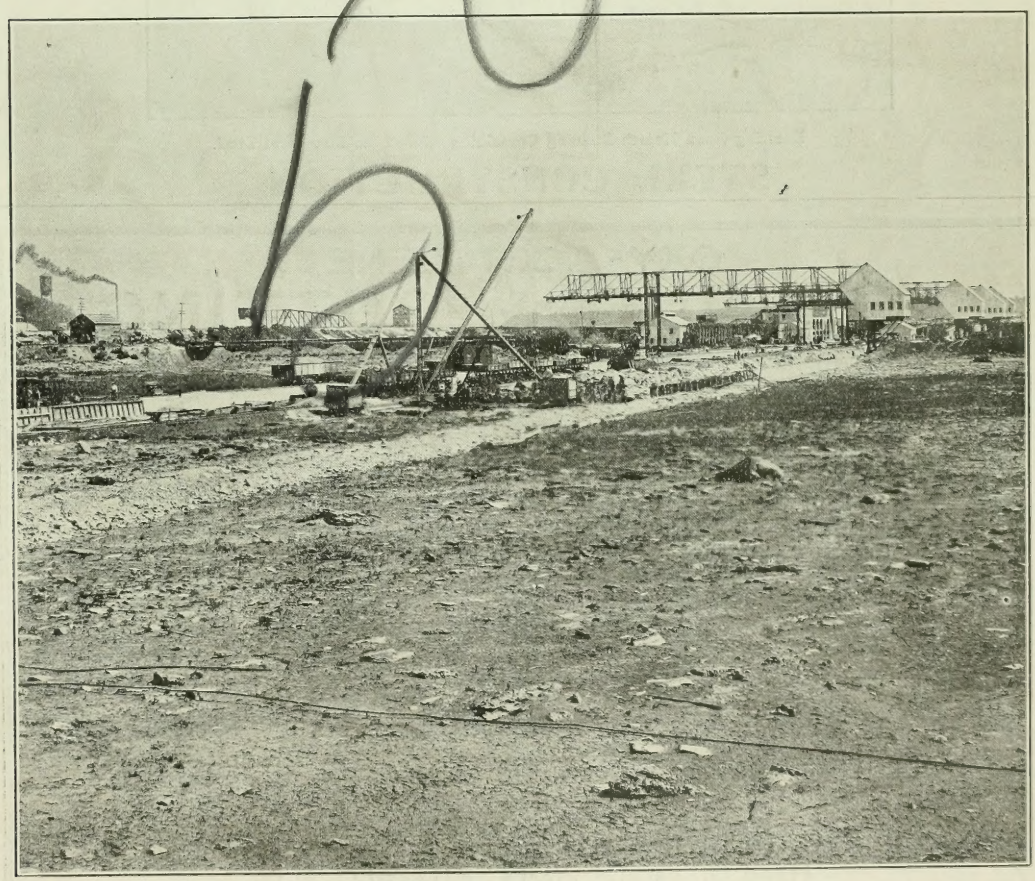
INDUSTRIAL WORLD

Published Weekly in the Interest of Iron, Steel, Coke and Allied Industries.

46th Year. No. 4. PITTSBURGH, PA. MONDAY, JANUARY 22, 1912

BED OF THE MISSISSIPPI RIVER, DRAINED FOR NEW DAM AND POWER PLANT AT KEOKUK, IOWA.



Interior of coffer dam, almost in mid-stream, prepared for erection of power house. [*See description on page 100.*]

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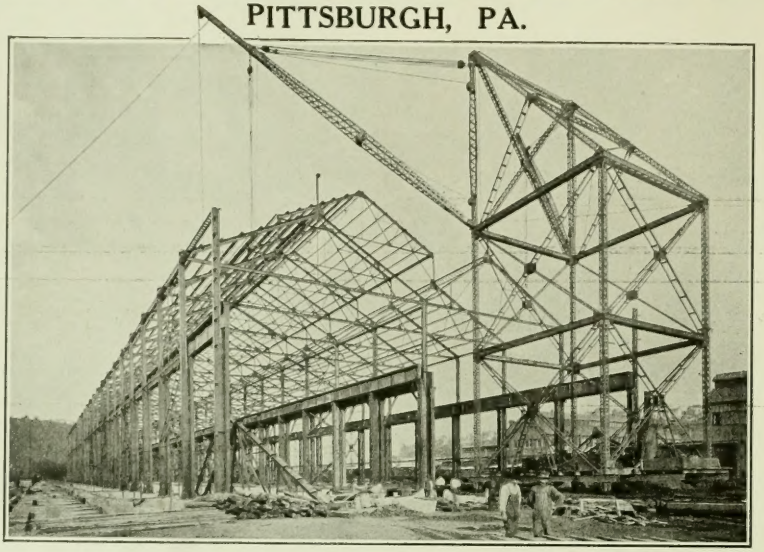
RITER-CONLEY MANUFACTURING CO.

PITTSBURGH, PA.



Erecting Open Hearth Building Containing 5,000 Tons Structural Steel.

STEEL CONSTRUCTION

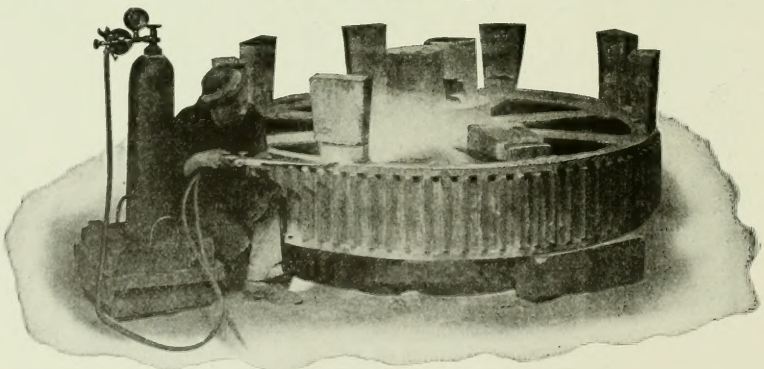
OXY-ACETYLENE

WELDING & CUTTING

APPARATUS

EFFICIENT

ECONOMICAL



SIMPLE

RELIABLE

Cutting risers from machine moulded gear at the Works of the Mesta Machine Company. These Risers which measured 4 in. x 8 in. were removed with the "UNIVERSAL CUTTER" in 1½ minutes each.

THE LINDE AIR PRODUCTS CO.

Head Office and Works: BUFFALO, N. Y.

INDUSTRIAL WORLD

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FORTY-SIXTH YEAR. PITTSBURGH, PA., JAN. 22, 1912. NUMBER FOUR.

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Summary of General Iron and Steel Markets

PIG IRON.—Heavy tonnages prompt and first quarter iron being taken up in Pittsburgh; little new demand into second quarter. Sales of 4,500 tons Northern No. 2 to Standard Sanitary Company from Valley furnaces, first quarter, show $13 Valleys. Prompt malleable up to $13.10@13.25. One sale full first half, standard malleable, at $13. Basic iron at $12.50 is called a bargain; Pittsburgh Steel Company renews January arrangement with Midland furnace for February supply of basic. Bessemer firm at $14.25, Valleys, with good tonnages moving. Market falls off in South, while Eastern Pennsylvania and Buffalo furnaces show stronger prices. Dull trading week in Chicago district.

CRUDE STEEL.—Quotations of $21 Pittsburgh still continue on sheet and tin bars, and reports of premiums of 50 cents to $1 a ton refer to small amounts. Billets are firm at $20, mill. Carnegie Steel Company is putting on its North Sharon and Columbus (O.) plants to relieve possible scarcity.

COKE.—By the close of the week the scarcity of Connellsville furnace coke was less pronounced. Maximum prices of $1.90 and $2 were paid for spot furnace coke at the opening of the week. The level for contract furnace coke is $1.75 to $1.85. Prompt foundry coke commands $2 to $2.20. Frick interests have put on 2,500 idle ovens since January 10.

SHEETS.—Continued activity with additional capacity put to work by Steel Corporation; prices unchanged. Output of both sheets and tin plate affected slightly by severe weather conditions.

BARS.—Heavy specifications; 1.15c minimum still available. Slackness in West results in shading of Pittsburgh base at Chicago.

PLATES, SHAPES.—Demand for structural material for early delivery exceeds operating capacity in some cases; prices held at 1.15c level. Forward contracting in structural not so heavy as at the opening of the month. Sustained buying of plates into second quarter.

WIIRE.—Persistent reports of coming advance of $1 a ton; demand heavy in West and South.

Points on the Market

Cold Causes Idleness.—Zero weather during the past 10 days caused losses in production in pig iron and steel. Output of some furnaces was decreased 20 to 40 per cent through necessity for banking them for days. Independent sheet mills in some cases closed for two days to a week.

National Tube Furnaces.—No. 3 furnace at the McKeesport plant of the National Tube Company was lighted January 15, leaving one furnace at the plant still idle. The fourth stack will be lighted within a week. At Lorain, O., a fourth furnace was lighted at the opening of the week, after an idleness of a year. This leaves only one of the five Lorain stacks idle.

Resumptions in Wheeling District.—Labelle tin plate plant of the American Sheet & Tin Plate Company, at Wheeling, resumed last Tuesday, after an idleness of 18 months. Three hot mills were started on Tuesday, others coming in later in the week. At the Aetna-Standard sheet plant of the company at Bridgeport, O., 12 hot mills were in operation at the close of the week.

Steel Pipe Order.—National Tube received an order for 19 miles of 18-inch steel pips from city of Moose Jaw, Alberta province. The contract calls for about 4,000 tons.

Bar Iron Scale.—Annual settlement of bar iron wage scale for January-February period showed card unchanged at 1.20c, which makes puddling mill wage $5.50, same as for November-December. Bar iron is now selling up to 1.30c.

Steel Barge Orders.—Rogers Sand Company ordered two steel barges, 130 feet long, 600-ton capacity, from Jones & Laughlin Steel Company.

N. Y. Central Rail Tonnages—Explaining the disappointing total of 110,000 tons in the current New York Central rail order, President W. C. Brown, of that system, says: "The New York Central lines' orders for rails required for maintenance purposes are 110,000 tons." President Brown refuses to justify predictions of a further New York Central order.

VALLEYS FURNACE INTERESTS LAUNCH OPEN HEARTH STEEL PROJECT AT YOUNGSTOWN.

"CONNECTING LINK" TO BE BUILT BETWEEN FURNACE STACKS AND FINISHING MILLS CONTROLLED BY SAME MEN—SIX-FURNACE STEEL PLANT DESIGNED FOR INITIAL INSTALLATION—WILL TAKE IMPORTANT MERCHANT IRON INTERESTS PARTIALLY OUT OF OPEN MARKET.

Interests connected with the Brier Hill Iron & Coal Company, of Brier Hill, O.; the Youngstown Steel Company, of Youngstown; the Thomas Steel Compand, of Niles; the Empire Iron & Steel Company and the DeForest Sheet & Tin Plate Company, also of Niles, are directly or potentially responsible for an application for an Ohio charter made last week for the Brier Hill Steel Company, which proposes to build an open hearth plant at Brier Hill, near Youngstown.

The capitalization of the new company will be $15,000,000. The incorporators as named in the application are as follows:

H. H. Stambaugh, John Stambaugh, E. L. Ford, John Tod, J. G. Butler, Jr., W. A. Thomas and David Tod, all of Youngstown.

Following the receipt of the formal notice of incorporation the stockholders of the steel company will meet and organize and elect officers. Those interested say nothing definite has been done yet in the election of officers. It is reported that W. A. Thomas, of Niles, will be general manager.

The capitalization of the new concern is the largest of any exclusively Mahoning Valley institution, with the exception of the Youngstown Sheet & Tube Company, which also has an authorized capital of $15,000,000

Three Companies Committed.

The present Brier Hill Iron & Coal Company and the Youngstown Steel Company each operates one merchant furnace. The fact that the pig iron market is gradually becoming more and more circumscribed, through the larger steel interests enlarging their furnace capacity has forced the steel plant proposition on the blast furnace interests. The open hearth steel plant is the logical solution. A plant of about six open hearths is contemplated at first, to be increased as circumstances demand.

Of the companies in the merger, the Brier Hill and the Youngstown Steel have an output of pig iron exclusively. The Thomas Steel Company owns a ten mill sheet plant at Niles. The Empire Iron & Steel Company, operating seven sheet mills at Niles and De Forest Sheet & Tin Plate Company, operating six sheet mills at Niles, also are expected to join in the project.

The two blast furnaces make between 250,000 and 275,000 tons of pig iron annually and thus could support a steel plant making 300,000 tons of sheet bars annually, but a plant somewhat smaller than this will probably be built. The three sheet interests consume between 75,000 and 100,000 tons of sheet bars annually. The Brier Hill Company has a large tract of excellent Connellsville coking coal with 457 coke ovens, while Youngstown Steel Company also has important Connellsville coking connections.

Have Their Own Ore.

The two furnace companies have large ore interests in the Superior regions, limestone deposits, and coal interests in the coke district which are second only to those of the United States Steel Corporation.

For years the two furnaces of the Brier Hill Iron & Coal Company and the Youngstown Steel Company have been the backbone of the Mahoning and Shenango Valley Bessemer Pig Iron Association.

There will be no bonds issued and all the stock has been subscribed. In addition to holding raw material the merger controls certain terminal and steamship interests.

The Brier Hill Iron & Coal Company at present owns 50 acres of land adjoining its present site at Brier Hill, which was bought years ago for a steel mill, and this land will be used Originally the Brier Hill Company sold pig iron to the Steel Corporation and more recently to the Youngstown Sheet & Tube Company, but both these companies now have their abundant furnace capacity.

The men chiefly interested in the Brier Hill Steel Company, control the companies which would consolidate to form the merger. H. H. Stambaugh is president of the Brier Hill Iron & Coal Company, John Tod is vice president, R. C. Steese secretary and treasurer, and J. G. Butler, Jr., general manager.

E. L. Ford is president and general manager of the Youngstown Steel Company, Paul Jones vice president, and John Stambaugh is secretary and treasurer.

W. A. Thomas is president and general manager of the Thomas Steel Company, which is capitalized at $500,000, and has a plant containing at present 10 hot sheet mills with galvanizing and corrugating departments.

RACK RAILWAY DEVICES.

Installation Begins at Gatun Locks.

The Panama "Canal Record" says of the progress of work on the rack railway devices, for which the Carnegie Steel has the contract:

The first consignment of towing track, consisting of 60 sections of rack track, each six feet in length, has arrived at Gatun locks. Delivery will continue from January 1, 1912 at the rate of 240 sections each week, which will complete final deliveries for all three sets of locks by October 1, 1912. Installation of the rack track has been started in the east side wall.

At each set of locks the towing system consists of seven lines of track, all running the entire length of the locks. Four tracks, two for the center wall and one for each side wall, are for towing and are equipped with a rack. Three racks one for each of the walls, are used to return the locomotives when not towing a ship. Each of the tracks is constructed of a pair of 90-pound rails bolted to Carnegie steel ties. The ties for towing tracks are spaced upon 3-foot centers and the ties for the return track have 3-foot 9-inch centers. The towing tracks and the return track at the inclines are, in addition, equipped with a cast steel rack, the rails alone not developing sufficient tractive effort. The rack is located upon the centerline between rails and projects seven inches above the top of the rails. All tracks are equipped with conductor rails on the off-tow side of the track.

"How to Increase Exports."

Franklin Remington, president of the Foundation Company, of New York, writes the New York "Commercial" as follows on the subject of the export trade:

Sir—Your letter of the 8th received requesting information as to how the promotion of foreign trade in the United States can best be made.

I can give you my personal opinion on this subject only. Foreign trade on the part of manufacturers can best be promoted by a more careful study on their part of the conditions in foreign countries where they desire to sell goods; by more willingness on the part of manufacturers to extend credit abroad to those who are properly entitled to it; by exercising more care in the actual packing and shipping of manufactured articles so that they arrive at their destination in proper condition; by cultivating a practice of corresponding in the language of the country in which they wish to sell goods, and by the general knowledge among our manufacturers

that in the foreign field we are up against such competitors as the Germans, who make a point of cultivating friendly relations with those with whom they wish to do business, and that with foreigners it is a good policy sometimes to depart from the methods of business in vogue in this country and do business with foreigners as they wish it done themselves.

As a result of considerable time spent abroad in which I have had the opportunity of studying foreign business methods, I am convinced that a great deal of business is lost to American firms by their "take it or leave it, cash on presentation of bills of lading" attitude.

COAL PLANT IMPROVEMENTS.

Power Plant Equipment Installed by W. J. Rainey Company.

The Erie City Iron Works Company, through its Pittsburgh representative, T. H. McGraw, Jr., is just completing several large power plants for the W. J. Rainey Company, of Uniontown.

At the old Revere works, a new 250 k. w. Erie City Lentz engine of the poppet valve type, direct-connected, to General Electric Company generator, has been installed.

At the Royal works, two additional 300 horsepower Erie City vertical water tube boilers, and one Erie City Lentz engine of the poppet valve type, direct-connected to 250 k. w. General Electric Company generator, have been installed.

At the Mt. Braddock works, three 300 horsepower Erie City vertical water tube boilers with large self-supporting stack, 84 inches in diameter and 175 feet high, have been installed, and also an Ingersoll-Rand latest design air compressor.

At the Allison works, where the Rainey company installed three years ago, four Erie City 300 horsepower vertical water tubes, they have now installed an additional power plant near Merrittstown, consisting of five 300 horsepower Erie City vertical water tube boilers, one britchen and 84-inch diameter, self-supporting stack, 175 feet high, one Erie City Lentz poppet valve steam engine, direct connected to a 250 k. w. General Electric Company generator.

These improvements it is claimed, place the power plants of the W. J. Rainey Company considerably in advance of any other power plants in the region. Such investments of capital prove conclusively the present tendency for securing maximum efficiency, and the determination to secure the lowest possible operating cost. The wisdom of this course is apparent to all who are familiar with the gradually-reducing margin of profit in the coke trade. The same policy extended through all of the departments can easily make the difference between a full dividend and the passing of one.

EQUIPMENT NEWS

For a Conveyor Plant.

Houston Brothers Company, dealers in coal and builders supplies, Thirty-second street, Pittsburgh, are arranging for the erection of an overhead tipple and storage bins for carrying a supply of coal, sand and lime. Conveyors will be installed to carry the material to the bins and wagons will be loaded by gravity. The materials will be delivered in bottom dump cars to minimize the labor of handling.

Locomotive Plant Additions.

Plans are being prepared by the H. K. Porter Locomotive Company, Pittsburgh, for extensions to its works, which will largely increase the capacity of the plant. Bids for the construction work will be asked for immediately.

New Power Equipment.

The Wheeling Coal & Coke Company has placed an order with the Erie City Iron Works, Erie, Pa., for the installation of an Erie City engine direct-connected to a 150 k. w. General Electric generator, which is being installed by T. H. McGraw, Pittsburgh representative of the Erie company.

Secures Ohio Agency.

The Brown Engineering & Equipment Company, Machesney building, Pittsburgh, has secured the agency in Ohio, West Virginia and Pennsylvania, for the Burgmann engine packing.

Coal Development Work.

Smith & Lewis, engineers for the Cross Creek Coal Company, have placed a contract with the Brownsville Engineering Company for sinking two shafts for the coal company's new mine at Burgettstown, Pa.

For Oxy-Acetylene Apparatus.

The Standard Steel Tank Company, Girard, Ohio, with offices in the Oliver building, Pittsburgh, has placed an order with the Davis-Bournonville Company for an oxy-acetylene welding machine, for welding tanks. The company also placed an order for a five-horsepower motor to operate a crane at its riveting machine.

Automatic Steam Traps Ordered.

Since the first of the year the McAuley Automatic Trap Company, Imperial Power building, Pittsburgh, has received contracts for the installation of automatic steam traps in the following power plants: Cambria Steel Company, Johnstown, Pa.; Malleable Castings Company, Indianapolis; Illinois Steel Company, Joliet; Carnegie Steel Company, Youngstown; Edgar H. Jenkins, Buffalo; W. J. Rainey Company, at Merrittstown, and Revere Works, Pa.; Pennsylvania Railroad Company, Pitcairn, Pa.; the Crane Company, Indianapolis; Sharon Steel Hoop Company, Sharon, Pa.; Pittsburgh Pipe & Equipment Company, Pittsburgh.

Castings for Ohio River Dams.

The Center Foundry & Machine Company, Wheeling, W. Va., has taken government contracts aggregating $25,000 for the supply of the steel castings for Ohio river dams 41 and 48.

New Power House Equipment.

The Cleveland Southwestern & Columbus Traction system is in the market for $100,000 worth of new equipment for Elyria (O.) powerhouse. Additional boilers, turbines and motors will be installed in order to increase the capacity of the plant which is now developing anywhere from 50,000 to 65,000 kilowatts daily. The plant furnishes power to Bucyrus and other central Ohio towns.

New Type Engine Installed at Carnegie.

The Erie City Iron Works has started up the 32x42-inch Erie City Lentz engine, newly-installed at the plant of the Superior Steel Company, Carnegie, Pa. This is the first large-size Lentz double-ported, poppet-valve steam engine installed by this manufacturer in Pittsburgh district. The engine is direct-connected to a 750 kw. Crocker-Wheeler generator, and is operating the entire electrical equipment at the Superior Steel Company, including its new industrial railway, as installed by the Arthur Koppel Company.

New Company to Store Gas.

The Schenk-Philadelphia Natural Gas Company, of Wheeling, with offices at 1123 Market street, that city has been chartered with the object of storing natural gas for motor power. It is capitalized at $1,500,000. Albert M. Schenk, of Wheeling, probably will be made president. Directors were chosen last week, but have not yet organized.

Turbines for Southern Plant.

The Kerr Turbine Company, Wellsburg, N. Y., was recently awarded a contract for furnishing 50 turbines of its manufacture to the Lummis Cotton Ginning Company, of Columbus, Ga., the largest cotton ginning machinery concern in the South.

These turbines will be used in connection with a new process of ginning cotton developed by the Lummis company. The award was made after a careful investigation and tests of efficiency in this particular line of work. This is the lar-

gest single order yet placed in the history of the small steam turbine. The Kerr Turbine Company is represented in the Pittsburgh district by the A. W. Wycoff Company, Farmers Bank building.

FAVOR CHEAT HYDRO-ELECTRIC

Morgantown (W. Va.) Business Interests Endorse Kuhn Projects.

The Morgantown, (W. Va.) Board of Trade, at its annual meeting January 15, went on record as favoring the development of the Cheat river by the construction of five dams. This action was taken by the adoption of the following resolution:

"Resolved, That the Morgantown Board of Trade desires to encourage the project of the improvement of the Cheat river and wishes to encourage those who may invest therein, believing that said improvement will be of great advantage of Morgantown and Monongalia county."

The Kuhn interests of Pittsburgh have at present under way three immense power dams, and preliminary work for these is about complete. The enterprise involves an expenditure estimated at $10,000,000 to $14,000,000. At the meeting State Geologist I. C. White said the Cheat river has the best power possibilities and that their development could not come too soon.

The board decided to petition the West Virginia representatives in Congress to work for the improvement of roads throughout the State. James H. Stewart was elected president and Charles F. Sutherland and Honorable George C. Sturgis, vice presidents.

SITE FOR AUTO PLANT.

Representative of New Company Options Property Near Pittsburgh.

It became known in building and supply circles last week that the Krupp Motor Works a new concern organized for the purpose of manufacturing automobiles, is in the market for a site in Pittsburgh district. H. F. Woodburn, a representative of the new company has optioned a 13-acre tract of land in the vicinity of Ambridge, Pa. It is the intention of the company, providing the land is secured, to erect a steel and concrete plant to cost $75,000.

The Rochester, Pa., board of trade has made a number of proposals to the company to locate its plant in that town. The Krupp company will manufacture three types of cars.

Governor Hadley, Missouri, has submitted plan to State legislature to work convicts on public roads.

TRADE MEETINGS

Annual Meeting, Engineers' Society of Western Pennsylvania.

At the thirty-second annual meeting of the Engineers' Society of Western Pennsylvania, on last Tuesday night, at the society's rooms in the H. W. Oliver building, Pittsburgh, Walther Riddle, the retiring president, delivered his annual address and James O. Handy, the newly-elected president, assumed the chair. The annual reports of the society also were presented. The report of the Board of Direction recounted nine regular, two special and one annual meeting during the year, with an average attendance of 134 members. The present membership of the society is 952. Chairman A. L. Hoerr, of the mechanical section, reported five meetings during the year, with an average attendance of 85; chairman R. B. Woodworth, of the structural section, reported five meetings, with an average attendance of 69. Chairman E. H. Haslam, of the membership committee, reported a gain of 101 in membership during the year, distributed as follows: Active, 76, associate, 3; junior, 19; junior student, 3. The junior student membership of the society is now 63; and the membership committee, in its report, emphasized the desirability of giving more prominence to this feature of the society's work.

Treasurer A. E. Frost received an ovation when, in offering his report, he modestly confessed it was the thirty-first annual document presented by him as treasurer. Total receipts for the year were $11,965.14; expenditures, $11,062.31. Assets of the society on January 1, 1911, were $12,511.61; on January 1, 1912, $13,502.74—a gain of $991.13. Secretary E. K. Hiles' report reviewed the work of the society during the year. Chairman J. O. Handy, of the entertainment committee, suggested in his report that the Saturday night smokers be made an institution, as a further means of promoting the social life of the society. Reports also were heard from John M. Chester, chairman of the finance committee; S. E. Duff, chairman of the publication committee, and A. R. Raymer, chairman of the house committee.

The report of the tellers at the annual election was heard, certifying the choice of James O. Handy for president; S. A. Taylor for vice president; A. E. Frost for treasurer, and A. A. Hare and William Hawley for directors to serve three years. On assuming the chair, President Handy gracefully acknowledged the honor shown him by the society, and introduced the retiring president.

Dr. Riddle chose for the subject of his annual address, "Protective Coatings," and incorporated in it the first announcement of the details of an interesting experiment which he recently completed by which the amount of oxygen taken up by a given quantity of oil from the air during a 10-day test was definitely proved.

The paper will be published in the society's "Proceedings" for February. The speaker asserted his faith in linseed oil as the most perfect protective coating, believing that the most highly satisfactory. China wood oil and the soya bean oil were only rivals of linseed, he believed, because of their price. "With the help of investigators now at work," said Dr. Riddle, "we may find, in time, a successful rival of linseed oil. But we have not developed it yet. The remarkable results attained by Chinese and Japanese in their laquers and japans are more the result of infinite pains and patience than of materials."

Dr. Riddle took up pigments, gums and resins, and thinners, in the latter part of his address, and devoted a brief final chapter to the protection of steel against weather — emphasizing the necessity above all else of having the steel clean and dry before the covering is applied.

The lively discussion that followed Dr. Riddle's paper veered instantly to the burning question of coatings for structural steel which is destined to be encased in concrete. In answer to questions on this problem, Dr. Riddle called attention to the fact that the perfect bond between the concrete and the steel might not be the last word in conservative construction; that the difference in expansion and contraction between steel and concrete demonstrated the need for some slight lubrication in many cases to avoid cracking. "The whole question of painted or unpainted steel for installations where it is to be covered with concrete is a complicated one," said the speaker. "We are not far enough along in this branch of the art."

G. H. Danforth, of the Jones & Laughlin Steel Company, called attention to the fact that "linseed oil does not get along with concrete."

The ideal practice, the speaker replied, undoubtedly involved a concrete protection over the linseed oil coat.

One member advanced in the discussion the theory that the concrete, in the chemical reaction that accompanied its setting, absorbs carbon dioxide, drawing the oxygen from whatever source it can; that, consequently it takes the oxygen from the steel itself, thereby cleaning the steel of rust. Dr. Riddle remarked that he believed improper mixing of concrete was responsible for much of the variable results sometimes obtained in concrete work—for instance, the water

and sand used in the mix in Pittsburgh often is high in free acids and carbon. Speakers referred to the recent uncovering of steel in steel and concrete srtuctures razed, and its condition. Arnold Stucki and other structural engineers present recounted their experiences with painted and unpainted steel. The speakers generally agreed that the conditions discussed in the case of structural steel imbedded in concrete did not apply in the case of reinforcing bars.

Pittsburgh Illuminating Engineering Society.

A meeting was held at McCreery's Pittsburgh, January 13, by a number of men engaged in illuminating engineering and the pursuit of light installation, to consider the possibility of organizing a Pittsburgh section of illuminating engineers. It is the intention that the society will become affiliated with the national organization.

The following gentlemen were appointed committee to prosecute the work of organization: C. E. Clewell, H. F. Hower, F. R. Fortune, C. J. Mundo, Berford Brittain and H. S. Evans.

Manufacturers and Contractors' Club.

At the meeting of the Manufacturers & Contractors' Club, in the Lewis building, Pittsburgh, January 16, it was reported that an ordinance was being prepared for the consideration of the city council, which provides for the collection of a fee for permits from contractors in all branches of the building trades which will make the inspection departments of the city government self-sustaining. The report occasioned vigorous protests from representatives of the various trades represented and a committee was appointed to confer with the framers of the ordinance before it is presented.

National Gas Engine Association.

At the last meeting of the National Gas Engine Association there were taken a number of steps leading to constructive work for the betterment of the trade. Among these was the appointment of a committee on publicity to secure, compile and publish information or data that would instruct the general user of gas or gasoline engines and help to disseminate educational literature on the subject. President Park has appointed this committee as follows: H. W. Jones, Chicago, chairman; Prof. P. S. Rose, Madison, Wis., and H. F. Smith, Lexington, O. President Parker and the members of the trade in and around Milwaukee are taking up their plans for consideration of a possible gas-engine exhibit or show (similar to the automobile shows being held this month), and it is probable that complete announcement of the plans will be forthcoming shortly. The newly elected officers of the association are:

O. C. Parker, La Crosse, Wis., president; H. W. Jones, Chicago, Ill., first vice president; Otto M. Knoblock, South Bend, Ind., treasurer; Albert Stritmatter, Cincinnati, O., secretary; executive committee, Otto M. Knoblock, South Bend, Ind.; H. W. Jones, Chicago, Ill.; Harry T. Wilson, Middletown, O.; M. A. Loeb, Cincinnati, O.; O. G. Parker, La Crosse, Wis.; E. J. Perkins, St. Joseph, Mich.; O. B. Iles, Indianapolis, Ind.; H. W. Bolens, Port Washington, Wis.; C. O. Hamilton, Elyria, O.

PERSONAL

Thomas J. Bray, president of the Republic Iron & Steel Company, and J. A. Topping, chairman of the executive committee were in Alabama last week on an inspection trip to the company's southern mills.

V V

E. J. Deckman, Pittsburgh representative of the Hoppes Manufacturing Company, manufacturers of steam specialties, Springfield, Ohio, has moved his office from the Frick building to the Oliver building.

V V

A party of members of the American Institute of Electrical Engineers left January 17 for an inspection trip of the Panama Canal zone. The party was divided into two groups, one leaving New York and the other leaving for New Orleans. One week will be spent in inspecting the work on the canal.

V V

Mrs. Clark Fisher, owner and manager of the Trenton Iron & Steel works, who was described at one time by minister Wu as "the most wonderful woman in America," occupies the position of honor on the frontispiece of the "American Economist" of January 12.

V V

Arthur D. Little, chemist and engineer, president-elect of the American Chemical Society and president of Arthur D. Little, Inc., Boston, Mass., has been nominated by the alumni association of the Massachusetts Institute of Technology as a member of the corporation.

V V

C. I. Starrett, who has been acting purchasing agent for the Republic Iron & Steel company, has been appointed regularly in that position.

Worlock Stone Company, Sullivan, Madison county, N. Y.; quarry and prepare stone for market; $30,000. Cyrus Worlock, Helen M. Worlock, Bernard M. Burke, Carastota, N. Y.

THE TRADE PRESS

Cuban and Venezuelan Ores.

[From Iron Ore, Ispheming, Mich.]

That the removal of the duty on iron ore will tend to assist the importers is certain. The former tariff of 40 cents per ton was reduced to 15 cents by the Congress preceding the present one. That left only 15 cents, and it encouraged the investment of money in some of the iron ore fields in other countries, notably in Cuba, where there is a great tonnage that is available for the American market. Now if the remaining 15 cents duty is removed, as is talked, it will give the foreign miners just that much more advantage in getting their ores into our country. They will be lessening their costs just 40 cents per ton over what it used to cost them to deliver a ton of their ore on our shores, and they have a big advantage over the American miners in a much lower wage scale. Labor is the important element in mining and manufacturing iron ore.

We notice that Canadian people have recently secured control of an iron ore property in Venezuela, near the mouth of the Orinoco river. The ore can readily be placed on boats, and the freight from the mine to American sea-coast points will be about $1.50 per ton, so you see the operators of the mine can get into our Eastern markets easily to compete with our prices. We would have to pay much more in freights to get Lake Superior ores into the Eastern markets. The Venezuela ores run from 50 to 60 per cent iron, being nearer the former figure on the average. Equipment for the mine is now being loaded at Philadelphia, one consignment having been shipped.

The Cuban ores are of much better quality than the Venezuelan, and are admirably adapted to the manufacture of steel. They are also very near our markets, and we may expect to see a considerable movement Americanwards from this source. It would be much more formidable as a competitor than the Orinoco country as vessels could make many more trips in a year. And in Cuba the mines and shipping can be conducted all the year round.

And despite all the talk to the contrary that tariff of 40 cents per ton was a pretty good protection to American mines and miners.

Carnegie on Competition.

[From the New York Commercial.]

Andrew Carnegie's belief that prices in the steel trade are now controlled by the corporations and that the consumer is at their mercy seems to be contradicted by another part of his own testimony

in which he stated that a partnership was more efficient than a corporation. He told the story of how he got the Union Pacific's order for rails without bidding for it in competition with other makers, and remarked that no corporation could overcome that sort of personal influence.

When a man who knows more about the steel business and is more alert than the heads of the big steel companies gets into the business for himself he will be able to secure his share of what is going. Mr. Carnegie did this in his day. He was sufficiently intelligent and wide awake to see the revolution the invention of the Bessemer and open hearth processes would make in producing steel, and he was forehanded enough to secure their adoption in his own mills when the whole trade was at the turning point of its existence. That made him rich beyond the dreams of avarice. Other chances like that will come again in all probability.

Take the rubber trade to-day. Anyone who can invent a process of devulcanizing rubber will make a fortune quickly. Take the glass trade. After years of costly experimenting a practical machine for blowing glass has been perfected, which will have results comparable to the Bessemer and open-hearth processes in steel-making. The leather trade has gone through a similar evolution very recently. No good manufacturing corporation is entrenched so strongly as to take hope away from individual genius. A revolutionary invention in making steel or anything else must be pushed in a big way. Capital is always looking for openings, and competition will spring up whenever the time is ripe. Though many whose opinions carry great weight favor government control to protect the consumer, such a policy would nevertheless be a mistake if it tended to check initiative and creative invention. The world cannot afford to lose the services of the Edisons and Bessemers of the future. As the contributing editor might say, too much government regulation may change Americans into a race of mollycoddles.

Water Power Plans Approved.

The Pennsylvania State Water Supply Commission last week approved the following applications:

The Shohola Falls Hydro-Electric Company, of Shohola, Pike county.

For the construction of a dam by the Hooversville Water Company on Fallen Timber run near Hooversville.

For the merger and consolidation of the Citizens' Water & Gas Company and the Williamsport Water Company into the Williamsport Water Company.

Lackawanna Railroad used 493,500 crossties during 1911.

ANNUAL BANQUETS OF TRADE BODIES.

Engineers' Society of Western Pennsylvania.

Plans are well advanced for the annual banquet of the Engineers' Society of Western Pennsylvania,which will be held on Saturday evening, January 27, at the Ft. Pitt hotel, Pittsburgh, at which it is expected the attendance will exceed 400. In accordance with the custom inaugurated by the society a year ago, the ladies will be specially invited, and in order to emphasize the social tone of the gathering, an informal reception at 6:15, in parlors at the Ft. Pitt adjoining the banquet hall, is being made a special feature of the announcements.

The speakers will include Dr. Earl Barnes, University Extension lecturer; Prof. Charles F. Scott, professor of electrical engineering at Yale, formerly with the Westinghouse interests in this city, and past president of the Western Pennsylvania society; Dr. James H. Harlow, hydraulic engineer, first president of the society; and Dr. W. O. Snelling, chemist at the Pittsburgh station, United States Bureau of Mines, who is also chairman of the Pittsburgh Section of the American Chemical Society.

Prof. Scott, now of Yale, is certain of an unusually warm greeting at the coming banquet, by virtue of his earnest labors for the engineering bodies of Pittsburgh district in past years. He was a frequent toastmaster of former banquets. Subjects to be dealt with by the speakers, as informally announced, will be:

Dr. Barnes—Efficiency, as Individuals and as a Society.

Mr. Harlow—Applications of Engineering to the Public Welfare.

Prof. Scott—A Presidency or a Professorship?

Dr. Snelling—Chemistry and Engineering.

The program is in charge of the entertainment committee, of which James O. Handy is chairman. Mr. Handy is the newly-elected president of the society.

Manufacturers and Contractors' Club.

At last week's meeting of the Manufacturers and Contractors' Club, in the Lewis building, Pittsburgh, committees reported that all arrangements had been completed for the annual banquet of the club, to be held at the Fort Pitt, to-morrow (Tuesday) evening. Indications are that the attendance will be the largest in the history of the organization, as over 200 invitations had been accepted.

The following members will have charge of the affair: Banquet committee, Harry Kennedy (chairman), R. O. Belles, T. S. Morgan and S. A. McRoberts; speakers' committee, Wilber Shenk (chairman), S. M. Murphy, and H. L. Kreusler.

George H. Danforth,
Secretary, Manufacturers and Contractors' Club of Pittsburgh.

D. L. Gillespie, of D. L. Gillespie & Company, will act as toastmaster. The speakers, as far as announced, will be: Mayor W. A. Magee; Hon. John M. Goehring, president Pittsburgh city councils; F. R. Babcock, president Pittsburgh Chamber of Commerce; C. P. Hill, Doubleday-Hill Company; Architect Edward Stolz; Hon. C. M. Kelly, member of State Legislature; A. T. Burns, Pittsburgh Civic Commission.

Pittsburgh Section, Electrical Engineers.

Preparations are well under way for the annual banquet of Pittsburgh Section, American Institute of Electrical Engineers, which will be held in the English room of the Ft. Pitt hotel at 7 p. m., Saturday, February 17. The banquet committee, of which K. C. Randall is chairman, announces that L. A. Osborne, vice president of the Westinghouse Electric & Manufacturing Company will act as toastmaster. The guest of honor and principal speaker will be Gano Dunn, of New York, president of the American Institute of Electrical Engineers. Other speakers will be Director A. A. Hamerschlag, of Carnegie Tech, and Henry E. Longwell, consulting engineer with the Westinghouse Machine Company. A fourth speaker has accepted tentatively, but his name is withheld pending definite assurance that he will be here.

The invitations include the ladies, as is the custom with Pittsburgh chapter.

Last year's banquet was held at the Rittenhouse in the East End, but this year the committee deemed it better to "come downtown" for the celebration. At least 350 plates will be taken.

BUSINESS TROUBLES

PLATT IRON WORKS.—Authority to sell the Platt Iron Works at Dayton, including all its real estate, equipment, etc., as a going concern, was applied for in the United States District Court at Cincinnati, last week, by J. F. Hartlieb, Hugo Victor and A. Clifford Shinkle, trustees in bankruptcy. The petition stipulates that the concern will be offered for sale at public auction as a going concern for cash, and that it will not be sold for less than 75 per cent of its appraised value, this being approximately $1,500,000.

It is further prayed in the petition that: "In connection with such sale reasonable and proper opportunity may be given in the discretion of the court to creditors desiring to become purchasers to use their claims in such manner and to such extent, and under such conditions as the court may order in payment or in part payment of the purchase price for proper purchase."

The sale is to be subject to the lien of the existing bond mortgage to the Cincinnati Trust Company in the sum of $800,000 and other lines. The business of the concern will be continued as heretofore until the sale, and it is expected that it will be stipulated that the purchaser continue to operate the concern and carry out all of the existing contracts. The court will set the date of sale.

EUREKA FOUNDRY COMPANY.—William H. Merton, receiver of the Eureka Foundry Company, of Cincinnati, reported last week that he was appointed July 7, 1911, and that the year before he took hold the company ran at a loss of $30,000, while his receivership thus far has been run at a loss of but $600. He reported the assets to be $124,063.61 and the liabilities $70,725.63. The court ordered him to continue operating the business.

Complains on Express Charges.

The Pittsburgh Motor Company has filed a complaint against the charges of the Adams Express Company from East Pittsburgh to Trafford City. The distance is 4.8 miles, and the rate is 50 cents per 100 miles, while there is no greater charge between East Pittsburgh and Pittsburgh, a haul of 12 miles.

Boston's average property valuation for three years is $1,403,848,440.88

BIDS ON NEW WATER WORKS PLANS AT ERIE, PA.

The following list of bids have been received by the city of Erie, Pa., for the erection of a standpipe for the high service district in accordance with plans and specifications of Chester & Fleming, hydraulic engineers, Pittsburgh:

For standpipe—

Bidder	Cash Payment	4-year Payment	Work completed (months)
Tippet & Wood	$ 9,908.00	.....	15
Meehan	11,955.00	$12,300.00	18
Reeves Brothers Company	10,200.00	11,700.00	17
Sharon Boiler Works	11,254.00	14,618.00	12
Kennicott Company	11,070.00	11,300.00	18
R. Munroe & Son	11,540.00	.....	14
Petroleum Iron Works	10,750.00	12,000.00	18
Des Moines Bridge & Iron Company	10,800.00	11,490.00	16
The T. A. Gillespie Company	15,500.00	17,430.00	18
Chicago Bridge & Iron Works	9,925.00	10,275.00*	16

Bidders on Foundations —	Cash Payment	Completed months	Excavation cu. yds.	Extra concrete cu. yds.
Constable Brothers Company	$1,692.00	5	1.00	6.00
William Chisholm	2,327.50	8	...	10.00
Kerchner Brothers	1,375.00	16	...	7.55
T. C. Diffender	1,926.00	10	...	10.00
*O. S. Rivlet	1,156.00	18	.50	5.00
Mayer Brothers	700.00	..	...	....
The T. A. Gillespie Company	1,634.00	11	.60	9.00
P. T. Rasteah	1,825.00	15	....	5.70
J. W. Huff	1,500.00	12	...	7.00
Harry Schenck	1,958.00	3	1.00	8.00

*Awarded contract.

TO BUILD DIESEL ENGINE.

Site Selected at St. Louis for New Busch-Sulzer Plant.

A site at St. Louis has been bought for the newly organized Busch-Sulzer Brothers-Diesel Engine Company's factory, and the razing of buildings and grading will commence as soon as a few minor details of the purchase have been perfected. The factory will be at Second and Utah streets. The site contains eight and two-thirds acres, and represents a total cost to the company of nearly $173,000.

It is estimated that it will cost $100,000 to put the site in condition for the erection of the plant, which will consist of office buildings, power house, several machine shops, a main and smaller foundries, blacksmith shops, trade shops and testing shop. The buildings and equipment will cost $500,000. It is intended to enlarge the plant to double its first capacity as soon as it is in operation. Direct switching arrangements with the St. Louis Terminal Railway have been made.

The company, which is incorporated for $2,100,000, selected St. Louis after several offers had been made from other cities, among which were Detroit, Mich., and Dayton, Ohio. The company in St. Louis, of which Adolphus Busch is head, will be a sister company to concerns in Switzerland and Germany. Associated with Busch in the business in St. Louis will be Robert Sulzer, one of the original manufacturers of the Diesel engine, and Rudolph Diesel, inventor of the engine, which uses crude oil as fuel. Busch bought the patent rights for the United States and Canada in 1898, and for years has had in his mind the founding of this factory in St. Louis. He had an engine in operation in the Alps concession at the world's fair.

The corporation board of directors are: Adolphus Busch, president; August A. Busch, first vice president; James R. Harris, second vice president and general manager; Edward A. Faust, Eugene H. Angert and Daniel N. Kirby, all of St. Louis; E. D. Meter, New York; Robert Sulzer, Winterbur, Switzerland; Rudolph Diesel, Munich, Germany. The company's offices are in the South Side Bank building, 2923 South Broadway, St. Louis.

DECISION ON KRUPP SUIT.

Midvale Steel Company Wins Case in Supreme Court.

The suit of the Krupp Corporation, of Germany, against the Midvale Steel Company, of Philadelphia, in which it was alleged that the Philadelphians had stolen certain patents of the German company, used in the hardening of armor plate for battleships, was dismissed by the United States Supreme Court on January 15, thus ending a fight that lasted for more than two years and a half. The Krupp Company asked $20,000,000 damages.

Scotch shipbuilders during November launched 31 vessels, with aggregate tonnage of 45,000.

ROMAPAC CONTINUOUS RAILS FOR THE CHICAGO ELEVATED, ROLLED AT CARNEGIE MILLS, TO BE SUBJECTED TO UNUSUAL TESTS.

MILL RECORDS IN AMERICA AND EUROPE BROKEN IN TURNING OUT THOUSAND-TON ORDER AT HOMESTEAD PLANT—EXTRAORDINARY UNIFORMITY SHOWN AS RESULT OF ROLLING METHODS—DESIGN PROVIDES PERMANENT BASE WITH RENEWABLE HEAD.

CONTINUOUS RAILS, of the Romapac type, rolled during December at the Homestead plant of the Carnegie Steel Company, are to be subjected to severe tests on the Chicago Railways system. The Romapac type of rail provides a permanent base with renewable head for the rail, allowing the surface directly exposed to wear from the wheels to be removed without interfering with that part attached to the roadbed.

The rails were ordered from the Carnegie Steel Company by the continuous Rail Company, 307 Whitehall building, New York. The inventor of the new design, E. Rhodes, M. E., of this company, informs the INDUSTRIAL WORLD that the Carnegie Steel Company's Homestead works broke all rolling mill records, whether American or European, in getting out the 1,000-ton order for the Chicago Railways.

Originated in England.

The rail was invented in 1901. In 1905 an experimental track was laid in England, but some defects due to inexperience and faulty design developed. These defects were avoided, when half a mile was laid the following September in Kirkstall road between Spark street and Adelphi street, Leeds, Yorkshire, England. The rails were each 45 feet long and no fish plates or other mechanical bands were used.

The inventor furnishes the following data of present practice with the continuous rail:

Electrical tests made by W. T. Glover & Company, Ltd., of Manchester showed that a perfect electrical bond of 100 per cent efficiency is made between the upper and lower sections of the Romapac rails, so that no electrical bending or welding is at all necessary. The conductivity of the continuous rail is greater than the section it replaces, so that electrolysis is avoided.

Process of Manufacture.

Etchings of the head section of the continuous rail manufactured by the Carnegie Steel Company show extraordinary uniformity of texture and exceptional homogeniety of the steel, owing to the method of rolling. During no less than seven "passes" this section is subject to the direct pressure of the faces of the main rolls, so that the running surface of the rail is thoroughly worked. This "working" of the metal cannot be obtained in the rolling of a complete rail in one piece. If, as many engineers believe, rail corrugations arise from lack of homogeniety in the head of the rails, the continuous rails, the inventor believes, may solve this problem. At any rate, the Leeds track laid in 1906 shows up to date no signs of corrugation, although the standard track in some road suffers heavily from that trouble.

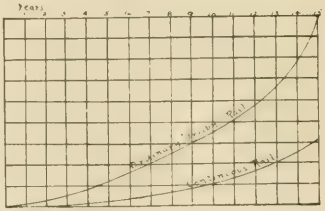
The Leeds track is all straight work, as is the track laid in Chicago; but curves have been laid in Paris, France, as sharp as 86 feet radius on the street, and as sharp as 165 feet radius on the subway. The method of rolling the head of the continuous rail gives such excellent results that experienced mill men predict an increased life to the rail amounting to fully 30 per cent.

From the experience gained in England the curve of maintenance expenses shown in another column of this page has been prepared.

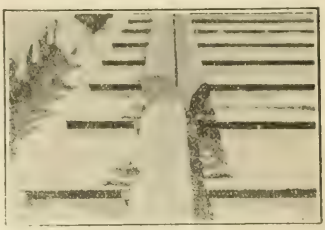
The continuous rail has been subjected in England to hammer tests, electrical tests, deflection tests, joint tests, wearing tests and shearing tests. In Paris the continuous rail has been tested on sharp curves, where it has been fished up with ordinary tee rails.

Among the tests to which it will be subjected in Chicago is a subscructure test. On South Halsted street south of Thirty-fifth street, the west track is laid with continuous rails on a substructure made in the following manner: The rails were leveled on blocks, and the trench was then filled with ballast up to the under side of the tie beams and tamped after which the surfacing concrete was filled in. The east track alongside, was on the other hand laid with standard trilby rails on a substructure of well-rolled ballast, so that the test will be continuous rail on loose ballast against standard rail on rolled ballast. Tests are also being made in Chicago of unsupported joints in the base rail, previous tests of the continuous rail having been with those joints supported on the ties.

The sliding test on the Chicago rail shows that it would take 4,340 tons pressure to move the heads of a pair of 60-foot rails .03 of an inch.

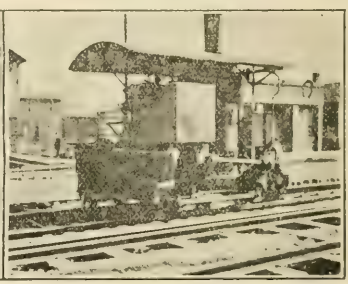


Maintenance expenses contrasted.



Showing head of continuous rail ready for crimping.

Base of continuous rail, laid before head is applied.



Crimping machine on track ready for service.

JUDGE GARY ANSWERS BRANDEIS CHARGES.

CHAIRMAN E. H. GARY, of the United States Steel Corporation, issued a staement on January 16, replying to charges of labor-slavery made against the United States Steel Corporation by Louis D. Brandeis at a Republican Club's luncheon in New York, on January 13. He does not precisely deny what Mr. Brandeis said, but rather explains conditions and asks for fair consideration. He says it is always a question whether wages are high enough, but he is sure the Corporation is paying more than ever before, and that it means to make things better for the men.

The seven-day week of which Mr. Brandeis complained, he says, is worked by the men in order to earn extra money, and the same is true of the 12-hour day, but "to a large extent" he believes these working hours have been abandoned.

Here is Chairman Gary's statement:

"We do not resent criticism. On the contrary, we endeavor to benefit by it when we believe it is deserved. Many times statements are made which are not based upon the facts, and conclusions are drawn which we think are not justified. We would, of course, prefer to have any one interested in our affairs make inquiry of us in regard to the facts before indulging in unfavorable public criticism. It seems to us this would be fairer and wiser. However, there appear to be two different opinions with reference to this question. There should be a disposition on the part of all thinking persons to avoid hasty conclusion, to refrain from unjust attack, to encourage friendly relations between all classes, rather than to excite unnecessary animosities; and, more, to use every reasonable effort to overcome and eliminate any real and substantial abuses on the part of any one or any interest.

Making Liberal Expenditures.

"I am not satisfied that our management is wholly in accord with the sentiments above expressed, though such is our intention, and I trust will be recognized to be our conduct. I believe, taking everything into account, the treatment, accorded by our corporation to its employes compares favorably with that of any line of industry in this country or any other country at the present time or any period in the history of the world. I may be mistaken, but I believe not. We are paying 25 per cent higher wages than we were when the Corporation was organized, and we have spent and are spending millions to prevent accidents in the works to improve the sanitary conditions, to furnish voluntary relief in case of accident, regardless of legal liability, and for pensions to superannuates. We have standing committees constantly engaged in welfare work. We have largely abandoned seven-day-week work and have to a large extent eliminated 12-hour-a-day work. It is true there is considerable of the latter still in force; but this is largely because the employes prefer 12-hour-a-day work in order to receive a larger compensation. This question, therefore, comes back to the amount paid for labor.

"We could, of course, reduce the hours of labor by reducing the wages. Whether or not we are paying as much as we ought to pay is one always up for consideration. It is well known we have in the past declined to reduce wages when many, if not most, others were making reductions. Above all, we are trying to satisfy our employes that they are receiving fair and liberal treatment; and I think they appreciate our efforts. As to the disposition of the Corporation toward its employes, I would refer to remarks made by me to the presidents at one of their meetings many months since, which were not made for publication, but were given out by some of our officials.

Wages Never So High.

"As to the business success of the Corporation since it was organized, it would not be becoming for the management to say very much at this time. We publish the facts and figures from time to time and leave those who are interested to determine. We are making a better quality of products at a less cost, considering everything,and selling at lower prices on the average, and are paying higher wages than ever before in the trade. We have increased and are increasing our export business enormously, and during the year 1911 it amounted in dollars and cents to not less than 70,000,000—probably 10 times as much as the subsidiary companies were doing at the time of the organization of the Corporation.

"Our Corporation and its affairs have been under investigation by various departments of the government most of the time for many years, and the pending government suit has brought into question our organization and its management since; and we believe, if every one interested will keep cool and postpone judgment until full development of all the facts and conditions is made, there will be no good ground for charging that the creation or the management of the Corporation has been inimical to the public welfare."

In giving out the statement, Judge Gary asked that the fact be emphasized it was at the request of the newspapers. Ever since Mr. Brandeis made the labor enslavement charges at the Republican Club, Judge Gary has, in fact, been persistently asked by newspaper men for a reply. Judge Gary stated that he was inclined to reply to the charges only after having fully considered them.

An official of the Steel Corporation pointed out that the condition of the steel workers was much better now than it was 20 years ago, their work having been greatly lightened by mechanical devices and their lives and health protected by safety devices. This official, too, admitted that a 12-hour day was objectionable from a sociological and economic point of view.

Perkins, Beveridge and the Roosevelt Boom.

[Washington Cor. N. Y. Tribune.]

The report that Senator Beveridge and George W. Perkins, recently a partner in J. P. Morgan & Company, have entered into an agreement to do team work for the nomination of Colonel Roosevelt does not cause much surprise in Washington. The hostility of the firm with which Mr. Perkins was formerly associated and of all those who entertain friendly relations with it to President Taft ever since suit was brought against the United States Steel Corporation is well known. President Taft had abundant warning, even before the suit was brought, of the implacable enmity he would incur thereby. Furthermore, Mr. Perkins is doubtless incensed by the suit against the International Harvester Company. Senator Beveridge has never liked the President, and he doubtless attributes his defeat in his last race for the Senatorship largely to the President. On the other hand, it will be recalled that President Roosevelt went into Indiana and eulogized Mr. Beveridge in the most glowing terms in his campaign for re-election, and, despite the fact that Mr. Roosevelt had little use for Senator Beveridge when the former was in the White House, the ex-Senator doubtless prefers him to President Taft. The close relations which have long existed between Mr. Beveridge and Mr. Perkins are also well known. It may be recalled that it was Senator Beveridge who, at the instance of Mr. Perkins, nearly succeeded in sidetracking the investigation of the Postoffice Department in 1903—an investigation which subsequently resulted in numerous indictments and convictions. The successful efforts of Mr. Beveridge to "call off" the one newspaper which first secured a line on the postoffice graft are well known to all who followed events in Washington at that time.

THE LONGEST SOLID CONCRETE STRUCTURE IN THE WORLD; POWER PLANT OF MISSISSIPPI RIVER POWER DEVELOPMENT CO., AT KEOKUK, IOWA.

REPLACING OLD FEDERAL DAM AT DES MOINES RAPIDS WITH A MODERN WATER POWER INSTALLATION — INTERESTING DETAILS OF THE CONSTRUCTION PLANT—TOWNS IN THE VICINITY PREPARE TO ADVERTISE CHEAP POWER.

By Frank C. Perkins.

THE Mississippi River Power development near Keokuk, Iowa, has aroused the attention of hydro-electric engineering authorities the country over, since work on the project started a year ago. A number of engineering bodies recently have visited the work. The power plant at this new dam is designed to develop the greatest amount of hydro-electric power in any single power station on earth.

This power development is located on the Mississippi, between Keokuk, Iowa, and Hamilton, Illinois, at the foot of the Des Moines rapids. The power company's interest in the enterprise is in the sale of electric power. The project involved the building of a solid concrete dam across the river, a power house, and a new lock and dry dock for accommodation of river traffic. The United States government and the power company are jointly interested in the enterprise. The government secures, free of cost, a new lock and dry dock to replace the present canal and three locks, which will be submerged by the new dam, the new lock being much larger than the old ones. The government secures also a new permanent navigable stage of water for a distance of 60 miles north of the dam. Only during high stages of the river is it now possible to navigate the DesMoines rapids, which extend over a length of 7½ miles of river, except by the use of the present canal and lock system, occupying the Iowa side, finished in 1877.

The present government lock system, with its three divisions and the amount of dredging and other expenses involved in its maintenance, have been from the beginning a source of large annual outlay to the government, practically all of which will be saved upon the completion of the present works.

Economy for the Government.

The improvement to navigation for the district 60 miles above the dam as a result of the construction of the power work, to which the government contributes no money, is of great importance to navigation interests, and the lock system is designed for an eight-foot channel should this depth be eventually accomplished by Federal action. The improvements above referred to could not have been secured by the government except by an expenditure of something over $5,000,000.

Fig. 1—A nearly completed spillway, section, Illinois division.

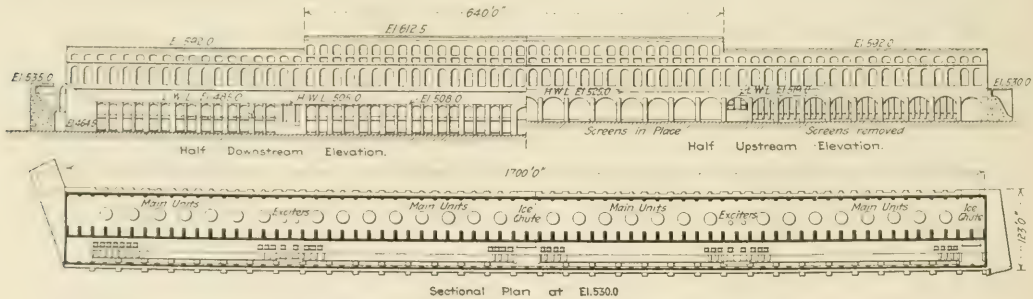


Fig. 2—General design of Mississippi River dam, at Keokuk, Iowa.

Some Dimensions.

The dam, including abutments, is 4,560 feet long, or seven-eighths of a mile. The spillway section is 4,278 feet; height 32 feet above river bed; base 42 feet wide. On top of the spillway are 119 steel flood gates, 30 feet wide, 11 feet high, supported by concrete piers. These piers are six feet thick, and are built as an integral part of the dam. The piers also support an arched bridge, and the gates are operated by electric hoists. By manipulating these gates the water above the dam is to be maintained at a nearly constant level.

Power House Construction.

The dam is of concrete, without reinforcement, locked firmly into the rock bed of the river.

The hydro-electric power house is 1,400x123 feet, the substructure of concrete, in which is molded the water passages and water wheel chambers. On top of this is the superstructure, of concrete, brick and steel. The height of the power house from foundation to roof is 133 feet.

In all there are 30 power generating units provided for, each unit consisting of a vertical steel shaft, on the lower part of which are two turbines or water wheels. The weight of the generator is carried on a suitable thrust bearing, located in a chamber just below the generator, and each unit has its own speed governor and auxiliary apparatus.

In order to keep floating ice and logs from entering the power house, an ice

fender has been provided, 2,800 feet long. To the eye it appears as a solid wall fencing off the power house from the river. There are large arched openings below the water level, through which the water will find its way to the power house.

It is claimed that no part of the construction is founded upon artificial foundations, as solid blue undisturbed limestone rock is everywhere available. There is required in the construction approximately 550,000 cubic yards of masonry, 650,000 barrels of cement and 7,000 tons of steel.

St. Louis to Be Supplied First.

The operating head at the plant will vary from 39 to 21 feet, and there will be developed and for sale 200,000 electrical horsepower. The first long-distance transmission line will be run to St. Louis. As the power market develops, transmission lines will be run in other directions, radiating from Keokuk and Hamilton.

The concrete mixing plant for the main dam is a most complete installation. The upper part of this structure is a large wooden bin, containing sand and stone. The lower part is a series of concrete arches. Under these arches are seen the projecting ends of the concrete mixing machines. The sand and stone are fed down through openings in the bottom of the bins into the mixers, where water and cement are added, and all materials are thoroughly mixed in the revolving drums, which discharge their contents after mixing into steel buckets resting on cars which run on the track shown in the center of the picture. (Fig. 4). The concrete is then hauled out to the point of use on the dam by small locomotives.

No part of the work has been done by the contract system. The men are employed and directed by the chief engineer, and all apparatus and its arrangement is designed by the power company's engineering department, under the direction of the chief engineer. The construction work is handled by two distinct organizations. The Illinois division built the dam, and the Iowa division built the power house, government lock, and dry dock.

Beginning of Construction.

The first stage of construction consisted of assembling and erecting a construction plant for each division. Each construction plant consists of a concrete mixing plant, a stone crushing plant, a central power plant supplying compressed air and electric current to the works, a machine shop, a carpenter shop, warehouses for storing cement and miscellaneous materials, and other structures.

The method of building the dam in the river was unique. A coffer-dam consisting of a rectangular timber crib structure, loaded with stone and made watertight by means of clay puddle, was built around the site of a section of the dam, about 400 feet long, the water then being pumped out of this coffer-dam. In this space thus made dry a trench was excavated on which the dam is founded. The piers and arches forming the bridge and the bottom part of the dam between these piers were built, and after this the coffer-dam removed and another section of about 400 feet was cofferdammed—continuing until the bridge is extended all the way from the Illinois shore to the junction with the power house on the Iowa side. This leaves 119 large openings between the bridge piers, through which the water of the river passes unobstructed. These openings are closed off a few at a time, by means of steel gates, and the balance of the concrete part of the dam placed behind these gates, gradually raising the crest of the dam until it has reached its full height.

Fig. 3—View of dam, looking toward Iowa shore, November 20, 1911.

The accompanying illustration (Fig. 4) shows the cantilever crane, which picks up the buckets of concrete from the cars, and dumps the contents in the forms. This crane is moved ahead as fast as the work progresses. In building the power house the method used was to construct a cofferdam around the entire area in which the power house was built, enclosing 37 acres.

Progress of the Work.

It was necessary to excavate a large amount of rock for the foundation of the power house, and for the tail race. After the substructure, came the placing of the hydraulic and electrical machinery. The river level will not be raised until all portions of the work below water lever have been completed, when the lake behind the dam will be allowed to fill.

On May 15, 1911, the preparatory work on the Illinois shore was completed, and the work of placing concrete in the dam began. On the Iowa shore, 15½ acres of the river bottom was bared, upon which the construction plant was erected. In order that all parts of the work be in close touch with each other the company installed a new work of telephone wires and a complete private system of telephones and switchboards. There are 70 phones in the system. All parts of the work on both sides of the river, and all departments of the main office, which is located in the business district of Keokuk, were thus brought into close communication.

The Initial Installation.

The first development will be for 120,000 electrical horsepower, 60,000 horsepower of which has been sold to the St. Louis public utilizes under a 99-year contract. The remaining 60,000 horsepower is to be sold in the cities near the plant, provided these cities manifest an interest in the matter of cheap power. Much preliminary work in various cities has already been accomplshed. Keokuk has raised $60,000 by public subscription for use in soliciting new industries to use the power. State legislation has been secured to enable it to raise additional funds by taxation for the same purpose. Quincy, Illinois; Burlington, Iowa; Fort Madison, Iowa; and Hannibal, Missouri, have taken similar steps.

The hydro electric power house and lock is located entirely in the bed of the river and before any work was done on either power house or lock it was necessary to surround the space in which they are placed with a cofferdam, which was divided into two parts in order that half of the necessary space might be unwatered quickly. This enclosed, each time, about 15½ acres.

Cofferdam Construction.

In the cofferdam, the cribs were 24x16

feet, with 12-foot spaces between adjacent cribs. The entire line of cribs was completed before any attempt was made to stop the current, the water passing through the 12-foot openings. The line of cribs completed, spaces were closed with square timber stoplogs, and the outside face of the cofferdam sheathed with a layer of planks, the structure then filled with stone rip rap and earth.

It was necessary for the bottom of the cribs to fit the irregular river bed, The method of determining the contour of the bed was to moor a raft of the same size as the crib directly over the spot where the crib was to be sunk, thus charting the bed by means of soundings, before the cribs were built on shore. It required 88 cribs to surround the upper half of the construction space, and the effort was made to have each crew of cribbers fill and place one crib a day. To this end a rivalry was encouraged between the two gangs, and a bonus of an increase of wages was promised to the men as soon as they should have placed an average of one crib a day for a period of 25 working days. The desired state of efficiency was soon reached, and thereafter cribs were built and placed at a greater rate than one per day for each gang.

Each crib contained 22,000 feet board measure of lumber. There were 151 cribs in all, requiring a total of 3,300,000 feet board measure of lumber. The entire cofferdam unwatered 33½ acres of river bed.

Transportation of Materials.

The stone required for the cribbing was obtained from a quarry opened just north of the Keokuk Electric Light plant at the extreme end of the power company's works. The earth used was stripped from the surface of the quarry by means of a steam shovel. The rock itself, after having been loosened by blasting was excavated by steam shovel. Both rock and earth were hauled from the quarry to the cofferdam in dump cars, each holding 12 cubic yards, and drawn in trains by small standard gauge locomotives. There are six of these locomotives on the Iowa works, four of 20-ton weight and two of 40-tons. The dump cars discharge their loads by tipping, under the control of the locomotive engineer.

For transport of materials it was necessary to build a standard gauge railway system with several miles of track. To cross the Des Moines Rapids Canal with this railroad, without interfering with navigation, the company built a trestle across the canal, with a steel drawbridge.

Excavating for Powerhouse in Midstream

The upper half of the space occupied by the powerhouse, 700x936, was pumped dry, pumping having commenced on April 28, using one 18-inch centrifugal pump, pumping at the rate of 10,000 gallons per minute. Pumping was carried on continuously for 60 hours, until April 30. There was no appreciable leakage through the cofferdam afterward, and practically the only water which was necessary to remove by pumping was that which seeped through the dike from the canal, and that which fell in as rain. Tis amount was very small and was handled by one 3-inch discharge centrifugal low-lift pump, of about 2-horsepower capacity, working 8 hours of the 24.

It was necessary to excavate a deep trench in the river bed for powerhouse foundations. The river bed was entirely of solid rock, and this excavated rock was not to be wasted, but utilized by passing it through a rock crusher, and after mixing it with sand and cement returning it to the powerhouse in the form of concrete. It so happens that the amount of rock necessary to be excavated from powerhouse site was almost exactly the amount which will be needed for concrete — approximately 300,000 cubic yards. It was therefore unnecessary for any other quarry to be opened for the purpose of obtaining stone.

The Concrete Plant.

The rock crushing plant was installed in the bed of the river near the site of the powerhouse and it discharged its product of crushed rock into large bins, directly above the concrete mixing machines, from which the stone was fed to the machine by gravity. The work of hoisting stone from the powerhouse excavation and of placing concrete in the powerhouse structure was provided for by means of four movable cantilever cranes, each one having two hoisting engines capable of lifting 10,000 pounds, one of these traveling cranes first being erected, the others as rapidly as needed. A temporary building was erected on the east side of the old government lock, which was utilized as a temporary powerhouse and machine, blacksmith and carpenter shops. This powerhouse con-

Fig. 4—Iowa division, looking north: Power house excavation, December 1, 1911.

tains one 350-horsepower and one 150-horsepower air compressor, furnishing air at 125 pounds pressure, which is transmitted through pipes to the various parts of the work. The air compressors are run by stationary engines in the temporary power house, and are supplied with steam by five boilers of total capacity of 1,000 horsepower. The shops are equipped with the usual machine tools, steam hammer, forge and other iron- and wood-working apparatus.

To provide for the contingency of possible fire, which might involve great loss of property and still greater loss through delay to the work, and also to provide cheaply the large amount of water which will be necessary to use in different operations, a water supply was installed, the water being pumped from the canal into a 100,000 gallon steel tower tank, and carried to all parts of the work in pipes.

So that work could be carried on at night there was placed in the temporary power plant a complete electric generating set, and the works are lighted at night by electricity from this plant.

Compact Plant on Illinois Side.

As mentioned above, it was decided to build the entire dam from the Illinois shore, necessitating a complete organization and construction plant entirely independent of the Iowa division. There are several advantages gained by this, among them the freedom from interference from railroad and river traffic, ample ground area for a suitable construction plant and most important of all an unlimited supply of excellent rock.

The concrete in this dam does not differ from many others in its ingredients —the mixture being one part cement, three parts sand and five parts broken stone. Its manufacture, however, is different in as far as no two concrete plants ever have the same natural consideration, which alone governs their design. The construction plant on the Illinois shore is remarkable for the limited space which it occupies. It was found possible to confine the entire plant, including the stone quarry, within a circle having a radius of 600 feet, with its center at the end of the dam. The plant consists of the quarry, the stone crushing plant, the inclines which convey the sand and crushed stone to the bins above the mixer plant, the mixing plant, the railway system, the central power plant and the traveling crane, which deposits the concrete into the dam. The quarry is situated about 300 feet from the dam. It has a face on an average height of 35 feet and an area of about seven acres. It was necessary to remove about eight feet of earth from the quarry site before suitable rock for concrete was found.

A 100-ton steam shovel loads this stone into 12 yard dump cars, for hauling to the crusher plant. The entire quarry force consists of but 15 men, and the output of stone is 1,000 cubic yards per day.

The Concrete Trains.

The crusher plant contains two crushers. The dump cars unload directly into the large crusher, it being of sufficient size to take the large stone from the quarry without any previous use of hand hammers. These cars are dumped by compressed air. A belt conveyor carries the broken stone up an incline to the storage bin, which holds 500 yards of crushed stone. Beneath this bin, and at right angles to it are two tracks which ascend still another incline to the bins of the mixer, which has a capacity of 700 cubic yards.

There is directly beneath the mixers a double track railway on which the concrete trains run. The trains consist of flat cars hauled by 13-ton locomotives. Each flat car is loaded with two bottom-dump, double-leaf steel concrete buckets The train stops in front of the mixers and each mixer having received its charges from the chute above, discharge its mixture into a bucket directly beneath it. The train with its load moves out onto the dam under the traveling crane, which picks the buckets from off the cars and places them into the forms.

The method adopted for building the dam involved the use of the dam itself from the Illinois abutment out as a means for transporting concrete and all construction materials and tools. Concrete trains can move out on the dam only as far as its superstructure has been completed.

Fig. 5—Iowa division: Construction of Plant in power house cofferdam.

The accompanying illustration shows a large gantry crane, known as the "dam traveler," erected on the Illinois abutment, and this crane moves forward as the work progresses and is always the connecting link for transporting a bucket of concrete from mixer to final location in the dam. The traveler is 25x90 feet, center to center, with cantilever extension 25x190, center to center. The main frame is permanently mounted on six cast steel track wheels, run on a special track of 100-pound rails and heavy I-beams, permanently fixed in the masonry. The gantry frame is arranged to accommodate three railroad tracks on the bridge, the clearances being 24 feet wide and 16 feet high above track rails.

The Crane Equipment.

One of the standard derrick cars may

pass through under the gantry. The traveler is provided with three overhead trolley runways, 10 feet apart and 210 feet long, each to serve one of the delivery tracks underneath. Each runway is equipped with its trolley tackle and rope carriers, all under control of one man by means of two engines. The engine platform is at the rear of the traveler, at a lower level than trolley runways, and the operators stand in positions commanding an unobstructed view of the delivery tracks underneath, and the entire work forward. The apparatus is designed for the highest speed of operation practicable within the limitation of length of runways. Traversing motion of trolley is by means of endless line and spool drum rig, actuated by a separate engine.

The hoisting and lowering motion is by a single running block rig, actuated by a more powerful engine. The engines are especially designed for this duty, and are operated by compressed air from the central power through a large receiver mounted at rear on top of traveler. Each bucket containing one and one-half cubic yards of concrete, with all suspended tackle, weighs four tons—that is the standard load to be handled. The trolley runways are located 24 feet above bridge, and are so rigged that loads may be picked up, moved in either direction or deposited at any point within their length. The forward posts of the traveler are 65 feet high, and the entire machine with all equipment on board weight 175 tons.

Steel Forms Used.

The 119 arch spans, 36 feet long from center to center of intervening piers, have a grade line of 53 feet above average bed rock bottom. The piers are six feet thick by 42 feet wide at the bottom, and 36 feet wide at top; and the bridge is 29 feet wide. Wood forms for this work would be complicated and their cost in time, labor and materials would be prohibitive. Forms made of structural steel were therefore adopted. The steel form for each pier contains a main frame of one up-stream leg and one down-stream leg, with connecting struts between at the top. The width of these legs equals the net thickness of the pier and they are spaced and located at the bottom by means of cast iron base plates anchored to small concrete piers built on the bed rock. The bottom of each leg has two sockets to receive projecting dowels in the corresponding base plate, and it will therefore be evident that no instrument work of any kind is necessary to line up the forms after the base plates have been accurately placed in position. The up- and down-stream legs are connected together continuously by side members about five feet high, forming a continuous steel wall on each side of pier from bottom up to springing line of the arches. These side members are securely bolted to the end legs and to each other and are stay-bolts through and through in a manner to withstand the bursting pressure of wet concrete.

Selecting Motive Power.

On account of the large number of motors employed to run the different machines, it was found necessary to centralize the generator and again the selection of the motive power required one that would be simple, safe and effective. Compressed air has all these attributes and near the end of the dam is situated the central power plant. It consists of the engine and boiler rooms, the engine room containing the air compressor and lighting plant. The air compressor is of the compound, two-stage type of 2,500 cubic feet of free air per minute, with an air pressure of 115 pounds per square inch. The boiler room, directly adjacent, has five boilers of 800 horsepower total capacity, which furnish steam to the compressor, dynamo and the crusher plant. The compressed air is used for running all of the derricks, the shops and stationary engines. It drills, paints, tests the rock, cleans belts, operates valves and pumps water.

Some interesting data is given of the materials and supplies used in the construction plant. There were 1,750 tons of structural steel in the temporary drawbridge, the eight traveling cranes, and the steel forms. More than 7,000,000 feet of timber and lumber were used for cofferdams, trestles, buildings, forms and general purposes, while 20 miles of 60-pound rails have been laid, making 10 miles of standard gauge railway track.

On the Iowa Side.

It was decided, on the power house side of the work, to locate the stone crushing plant as near to the mixing plant as possible, as a measure of economy; and they were, therefore, housed in a single building at the north end of the cofferdam space, near the power house site. The stone is taken from the power house excavation in air dump cars of 12 cubic yards capacity and hauled by standard gauge locomotives to the stone crusher. The screenings are transferred by a belt conveyor to an adjacent bin and are later used for ballasting railroad tracks and for paving purposes. The crushed stone, after leaving the screen, is hoisted by a second bucket elevator to the top of the building, where it falls onto a belt conveyor, which distributes it into five bins. The stone crusher and its elevators occupy the south end of the crushing and mixing plant.

The sand-elevating device is conveyed by a belt conveyor and a bucket elevator from a hopper to a series of bins directly alongside the stone bins. Sand is brought to the sand hopper from the Des Moines river, two miles below Keokuk, in trains of standard gauge 12-yard dump cars, which are dumped directly into the sand hopper. The concrete mixing plant is located directly beneath the stone and sand bins. The plant is in many ways a duplication of the one previously constructed on the Illinois division for building the dam. There are five revolving drum concrete mixers each each of a capacity of 1½ cubic yards of concrete per batch. The plant has a capacity of 2,000 cubic yards of concrete per day. Each mixer has a sand bin and a stone bin directly above it, supported by a concrete arch. From each of the two bins a steel chute leads down to the mouth of the mixer.

The concrete is discharged into steel buckets by the tilting of the revolving mixer drum. The concrete buckets rest on small flat cars and as soon as they receive their loads are hauled to the point where the concrete is being placed.

Comparisons With Panama.

There are four steel cantilever cranes spanning the site of the power house excavation and movable on tracks from place to place. They are used for hoisting stone from the excavation, for erection of forms, and for hoisting and placing concrete.

The new lock is 110 feet wide and 400 feet in length with a lift of 40 feet at low water. In every respect except length, this lock is as large as those being built at Panama.

The main traveler, places the concrete and consists principally of a 150-foot cantilever overhanging from a tower about 90 feet long. This cantilever supports three trolley-ways which pick the loaded concrete buckets from off the cars and place them where they can be dumped in the four piers ahead. These trolleys are operated by compressed air hoists which are situated at the rear of the traveler. The engineer is kept in touch with the position of the bucket by means of a single boy with a telephone, who stands just above the point of deposit in the forms, and telephones his orders to the engineer. The engine platform being at the rear of the traveler and lower than the trolleys gives the hoist-runners a clear view of their buckets in lifting them from the cars and replacing them when empty.

Work of the Travelers.

When an arch has been cast and allowed to set 48 hours, the traveler is moved ahead onto the next pier. In moving to its new position the traveler runs on a track placed at each side of the

arched bridge. This track, composed of 100-pound steel rails is fastened to 12-inch eye-beams which are embedded in the concrete.

In order that the steel forms may be always ready for the concrete, a second traveler, is used for erecting the steel forms, while a third traveler just behind the main traveler, dismantles them after they have served their purpose in each location. The second traveler is a common steel stiff-leg derrick, placed on wooden rollers. It moves over a wooden false-work, which rests on the steel forms just ahead of the main traveler, and after completing a section of steel forms it is moved ahead, made fast and is ready for the erection of another section.

The steel forms are made up of sections varying in weight from 9,000 to 13,000 pounds. These sections are interchangeable and are bolted together. In setting the forms the derrick picks up the end posts of the forms first and sets them on the doweled castings which have been acurately set and anchored to the small concrete piers mentioned above. These end-posts are then held in place by means of guy ropes, while the side-forms are put in place. After all the side-forms are in place the pier is connected to the one just preceding it by struts.

It is said that, while speed in the construction work has been made secondary to accuracy and quality of work, four piers and four arches per week, or about 100 lineal feet of dam has been averaged.

THE PASSING OF AN OLD CORLISS ENGINE.

When the load of the Pacific mills at Lawrence, Mass., was transferred to a newly completed turbine power plant, recently, it became necessary to dispose of the various scattered power units which had formerly carried the load. When the new turbine plant was ready, it displaced 181 engines and small turbines, totalling 30,000 horsepower besides 165 boilers of 36,000 horsepower and 7,500 horsepower water wheels.

Of the engines two 28x48-inch—160 revolutions—Buckeye engines, each of 750 horsepower; a Rice & Sargent cross compound engine of 800 horsepower, and a double walking-beam Corliss engine constituted the main source of power. The Corliss engine had done duty so long and faithfully and there was so much sentiment attached to it that it was displaced with much regret. Designed over 60 years ago, this engine resembles in general appearance the famous "Centennial Corliss" except that not being used for exhibition purposes it was not so elaborately finished. It was built in 1847 at Providence, R. I., by Nightingale, Bancroft & Company, and was one of the first engines that George H. Corliss was interested in. It was of the double walking-beam type, having two vertical cylinders 30 inch x 84 inch, both operating condensing. The engine was built to operate at 30 pounds boiler pressure at 30 r. p. m. and the speed was controlled by a throttling governor. The Corliss rotary cut-off valve had not been introduced when this engine was built. The fly-wheel was a large 20 foot x 18 inch face gear, driving a pinion on the jack shaft of a water wheel.

The condenser pumps were of the regular plunger type with two large clapper valves on the piston and one large rubber valve for the discharge. They were driven directly from the walking beams and received water under a 6-foot head. In 1897 the whole engine was subjected to a thorough overhauling, the valves adjusted to run on low pressure steam which was taken from an exhaust system into which nearly 100 engines and pumps of various sizes exhausted. About 350 horsepower was generated from the steam thus used, the remaining being used for manufacturing purposes. This feature of utilizing the exhaust steam is of interest as this was one of the first large power units to be so operated. While no economy tests were made of this engine the economy must have been good under the conditions with which it was run.

Undoubtedly there are similar ancient types of engines still in operation in the older plants of Pittsburgh district, but seldom are such old engines "written up," except when they are ripped out—and sometimes not then, through a mistaken fear on the part of owners of being called "out of date." Such a power unit, so long as it is capable of economical operation, is no sign of lack of enterprise on the part of an establishment, but rather a sign of careful maintenance and upkeep.

The new power plant at the Lawrence mills, which was designed by Charles T. Main, mill architect, of Boston, has given perfectly satisfactory results and it has been figured that the cost per k. w. hour is .841 cents.

Kansas City (Mo.) Gas Company was enjoined from increasing its rates on natural gas from 25 to 27 cents. Court's decision was based on inadequacy of gas pressure.

REVIEWS

"Carbonizing Coating."—The Gobeen Manufacturing Company, Canton, O., and London, Eng., is sending out a booklet devoted to the merits of its preservative paint preparation for structural steel, which is exposed to the elements. The only claim made for "carbonizing coating" is that it is the product of a mixture of pure red lead and pure linseed oils—with the additional declaration that it is a reliable insulating paint. For the preservation of steel cynide tanks the company also has an oxidized carbon cement, in liquid form. The booklet is illustrated with photographs of steel structures on which the company's paints are used—including the Pittsburgh & Lake Erie Railroad's new cantilever bridge, at Beaver, Pa., completed in 1910, on which the Gosheen company asserts: "The original paint failed in one year, exposing about 65 per cent of surface to corrosion. Bridge was cleaned and painted with two coats of carbonizing coating during the summer of 1911." Other structures illustrated on which the company's product is used, include the Vandalia bridge, Indianapolis; rolling lift bridges in the Chicago sanitary district; the Erie viaduct, at Jersey City, N. Y.; Delaware Avenue Elevated Railway, of the Philadelphia Rapid Transit Company; Ford plate glass plant at Rossford, O.; Consumers' Gas Company's gas holder, at Toronto, Canada; Des Moines (Ia.) "high bridge," of Milwaukee & St. Paul Railroad; Atlantic Coast Line Railroad shops; the Florida East Coast Railroad's viaduct over the Florida Keys; the Missouri river bridge of the Kansas City Terminal Company, partially completed last year, and the Union Pacific bridge at Omaha, on which last named structure the company claims a single coat of its product has given five years' service, "with less than three per cent deterioration and less than one per cent of breaks in paint, whereas the best previous record for a paint on this bridge was three years." The company claims its coating is used on the iron and steel of the Assuan dam, on the River Nile.

Bulletin No. 92 issued by the Universal Portland Cement Company, Chicago and Pittsburgh, presents views of the government lock and dam in the Mississippi river at St. Paul, Minn., the lock for which is 80x350 feet, with a lift of 30 feet; concrete pile work in Pittsburgh, and county bridge work in Allegheny county. Descriptions are also given of office buildings, hotels and apartment buildings of considerable proportions, which are being constructed of Universal Portland cement.

Weekly Summary: Investment Securities in the Metal Industries.

STOCK AND BOND SALES AT VARIOUS EXCHANGES.

Sales for January 12 to January 18, 1912, Inclusive.

	New York*	Pittsburgh	Chicago	Philadelphia	Boston	Total Sales	High	Low	Last
Ala. Chalmers	400					400	1	1	1
Ala. Chalmers pf.	200					200	6½	6½	6½
American Can	3,910		780			4,690	12	11¾	11¾
American Can pf	6,700		1,105			7,805	92¾	91½	92
American Car & Foundry	2,044					2,044	55	52⅝	52⅝
American Car & Foundry pf	600					600	116½	115½	115½
American Locomotive	650					650	34⅝	33¾	33⅝
American Locomotive pf	200					200	105	105	105
American Steel Foundry	300					300	32	29	29
American Steel Foundry			10			10	131	131	131
American Radiator pf			100			100	50¼	50¼	50¼
American Shipbuilding					25	25	78	77½	78
Atlantic					610	610	100¾	100	100
Atlantic pf				455		789	103⅝	103¼	103⅝
Baldwin Loco. pf.	332					400	31	30⅝	30⅝
Bethlehem Steel	400					200	61⅜	60⅝	61¼
Bethlehem Steel pf	200			142		142	44⅝	44⅝	44⅝
Canadian Iron				1,105		1,105	43¾	42⅞	43¾
Canadian Steel						320	26¼	26¼	26¼
Colorado Fuel & Iron	320					810	12¾	12¼	12¼
Corporate Steel		810				240	84	85	84
Corporate Steel pf		240				425	48⅜	47½	48
Crucible Steel pf			425			349	53¼	52¾	52¾
Crucible Pneumatic Tool				349		5,585	159⅜	158	159⅜
Electric Storage Battery	5,150				435	100	34	34	34
General Electric	100					810	76⅜	75¾	75¾
General Motors	810					7,420	11	10⅜	10⅝
General Motors pf.	7,420					725	108	107¾	108
Gt. Northern Ore Prop.	700		25			1,400	31½	30⅝	31½
International Harvester	1,400					550	84	82	83
International Pump	550					839	28⅝	28¼	28⅝
International Steam Pump pf				839		100	30⅜	30⅛	30⅜
Lake Superior Corporation	100					145	92	91½	91½
Lackawanna Steel		145				200	6	6	6
Maxim Howell pf		200				35	26⅞	26⅞	26⅞
National Fireproof		35				1,700	53½	52⅝	53
National Fireproof pf.	1,700					100	14⅝	14⅝	14⅝
National Lead	100					200	55½	55	55½
National Enam. & Stamp.	200					900	18⅛	18	18
New York Airbrake	700	200				900	81½	80⅜	80⅜
Pittsburgh Coal	200	100				28	101½	101¼	101½
Pittsburgh Coal pf.				28		300	33½	32⅜	32⅝
Pressed Steel Car	300					542	160⅝	160⅜	160⅝
Pullman Company	240				302	500	30⅜	30⅛	30⅜
Railway Steel Spring	500					200	101	101	101
Railway Steel Spring pf.	200					1,120	26	25½	25⅝
Republic Iron & Steel	1,120					1,285	85½	84½	84½
Republic Iron & Steel pf	1,285					100	16	16	16
Sloss	100					392,342	67⅝	65¾	66
U. S. Cast Iron Pipe	348,800	750	1,385	28,092	13,305	2,061	111	110¾	110⅝
United States Steel	1,920			15	126	500	88½	88½	88½
United States Steel pf		930				140	15	15	15
Union Switch & Signal	140					200	75⅝	74¾	75
Va. Iron, Coal & Coke	400					1,265	157½	155½	157
Va. Iron, Coal & Coke pf		1,265				11,647	71	71¼	73⅝
Westinghouse Airbrake	9,320	2,327				340	118	118	118
Westinghouse Electric	200	140				15	21	21	21
Westinghouse Electric pf.		15				312	11½	11	11
Westinghouse Machine				312					
Wayne Iron & Steel									

*Quotations are based on New York Stock Exchange, when listed on that exchange. New York Curb sales include Consolidated Exchange.

BOND SALES.

	High	Low	Last
NEW YORK.			
$7,000 Ala. Chalmers 5s	56½	54	55
5,000 Bethlehem Steel 5s	94¾	94¾	94
1,000 Brooklyn Edison 5s	103⅝	103⅝	103⅝
10,000 Colo. Fuel & Iron 6s	107⅜	107¼	107⅜
9,000 Int. Paper Deb. 6s	85½	85½	85½
2,000 General Motors 6s	98⅜	98¼	98⅜
2,000 General Motors 5s	158⅜	158¼	158⅜
1,000 Int. Steam Pump 5s	92½	92	92½
2,000 Int. Steel 5s 1945	92	91¾	91¾
5,000 Int. Steel 5s 1952	96¾	96½	96¾
4,000 Int. Steel 5s 1950	81½	81	81
3,000 Int. Steel 5s 1952	96¾	96¾	96¾
2,000 N. Y. Airbrake 6s	100	99¾	99¾
5,000 Ry. Steel Spring 5s	98¾	98¼	98¼
1,000 Pitts. C. I. & S. 5s 1940	95¾	95¾	95¾
5,000 Pitts. Steel 5s	103	102¾	103
5,000 Pitts. Steel 5s	103⅝	103	103¼
5,000 U. S. Steel Reg.	103	102⅞	103
1,000 U. S. Steel 5s	98	98	98
2,000 Western Elec. 5s	102¾	102¾	102¾
21,000 West. El. & Mfg. 5s	94½	94	94

PITTSBURGH.	High	Low	Last
$2,000 Pbg. Coal 5s	91½	91	91½
1,000 Mon. River Coal 6s	115½	115½	115½
CHICAGO.			
9,000 Chi. Pneu. Tool 5s	93	92	93
BOSTON.			
$8,000 Ill. Steel 5s 1949	100⅝	100¼	100¼
500 Dominion Coal	101	101	101
1,000 W. El. & Mfg. 5s	94⅜	94	94⅜
BALTIMORE.			
$7,000 Con. Power 4½s	89	88⅝	89
15,000 Fair. Coal 5s	96⅜	96⅜	96⅜
3,000 Jam. C. & C. 5s	93½	93½	93½

BALTIMORE STOCKS.

125 Consol. Coal	100⅝	100	100⅝
70 Consol. Pow. pf.	103¾	103	103½
100 Pa. Wat. & Pow.	60	60	60
475 U. S. Steel	66¾	66⅝	66¾

FISCAL STATEMENTS

U. S. Steel's Net Earnings Estimated.

For the entire year net earnings are estimated for the United States Steel Corporation at $104,150,448, which, after allowing for all charges and preferred dividend, would leave balance of about $29,690,278 available for common dividend, or about 5.84 per cent on the stock The last year was the lowest in earnings since 1908, when 4 per cent was earned on common stock.

Dominion Steel Company.

Stockholders of the Dominion Steel Company, of Montreal, have authorized the directors to issued preferred shares to the extent of $17,800,000, of which $7,000,000 will be sold in the near future.

Republic Iron & Steel.

The semi-annual statement of the Republic Iron & Steel Company will be made public to-day, covering the six months ended December 31. It is expected that earnings of about $1,700,000, more than enough to pay charges and preferred dividends, will be shown. The company has been taking orders at greater than top capacity for some time.

Absorbing Car Equipment Concern.

The Western Steel Car & Foundry Company, owned by the Pressed Steel Car Company, will exercise its option for purchase of the Illinois Car Equipment Company, of Hegewich, for $1,100,000. Illinois Car Equipment bondholders are offering cash to the amount of 99.95 per cent and accrued interest, or bonds equal to the old issue, issued by the Western Steel Car & Foundry Company, secured by first mortgage on the Hegewich property.

More Capital for Tube Company.

A certificate of increase of capital stock was filed at Dover, Del., last week by te Keystone Tube Works Company, of Connellsville, Pa., increasing capitalization from $200,000 to $300,000. The company was first incorporated November 4, 1908, with Israel Bollinger, of Pittsburgh, Charles Guyer and S. Brinton, of Wilmington, Del., as incorporators.

Power Company Bonds Offered.

The Eastern Pennsylvania Power Company, supplying all the commercial electric light and power for a population of 92,000 in and about Easton, Bangor, Pa., and Phillipsburg and Dover, N. J., is offering $1,750,000 first and refunding

mortgage 5 per cent 30-year gold bonds, exempt from taxes in Pennsylvania. They are dated August 1, 1909 and due October 1, 1939 and callable for sinking fund on any interest day (April and October 1) after August 1, 1914, at 105 and accrued interest.

Lee, Higginson & Company are offering the issue at 96 and interest. According to a statement just published the net earnings of the property for 1911 are nearly double the interest charges, and the concern's sinking fund is sufficient to retire 30 per cent of the entire issue. The operation of the sinking fund it is stated will substantially increase the company's equity in replacement value properties which is now above outstanding bonds.

Harbison-Walker Refractories.

At the annual meeting of the Harbison-Walker Refractories Company, the retiring directors were re-elected as follows: H. W. Croft, Hamilton Stewart, O. M. Reif, L. C. Turley, J. J. Brooks, Jr., George W. Reese, H. F. Bigler, J. E. Lewis, T. H. Given, R. W. Harbison, T. L. Chadbourne Jr., Hay Walker, William Walker and N. McQuillen. The board reorganized at once and re-elected the old officials, as follows: H. W. Croft, president; Hay Walker and O. M. Reif, vice presidents; Hamilton Stewart, secretary, and William Walker, treasurer.

The annual report for the year ended September 30, 1911, which has already been published, and which showed a surplus for the year of $430,201 after dividends on both the preferred and common stocks, and a total surplus of $5,215,061, was distributed among the assembled stockholders. It was stated that the company's business is progressing favorably and is keeping pace with the course of the iron and steel industry.

International Harvester Notes.

The announcement is authorized that the International Harvester Company has sold $20,000,000 three-year 5 per cent notes to J. P. Morgan & Company. It is understood that the $58,580,571 reported in the balance sheet of December 31, 1910, as representing the amount tied up in the notes of farmers and agents and accounts receivable has now grown to $75,00,000 as a result of the rapid expansion of business in the fiscal year ended December 31.

The large amount of working capital required, remarks the New York "Times," is an old story to the stockholders who were told in the last report that "the manufacture and sale of harvesting machinery probably requires a larger working capital in proportion to the volume of sales than any other commercial enterprise, because of the long credits extended and the necessarily large investment in inventories and manufacturing facilities."

The last report shows that the total assets of the company were $195,000,000 while the total sales of manufactured products for that year were less than half of that amount. Sales in the last report were shown to have increased 16 per cent over those of the previous year.

Westinghouse Electric-Machine Merger Project.

George Westinghouse, who was in New York last week, authorized a statement concerning the negotiations between Westinghouse Electric and the Machine Company for acquisition of the latter by the former. He stated the one of the first efforts of the late chairman of the Electric Company's board was to gain control of the Machine Company on terms that he (Mr. Westinghouse) thought would be disadvantageous to the stockholders of the Machine Company. Shortly after Mr. Mather's death an eastern banker suggested to Mr. Westinghouse that the old controversy between him and the late chairman might now, under changed conditions, be settled, and control of the Machine Company be acquired by the Electric Company on mutually satisfactory terms.

"The result of this suggestion, knowledge of which was communicated to some of the directors of the Electric Company," said Mr. Westinghouse, "was the appointment by the latter on November 6 last of a committee to consider the acquisition of the Machine Company. As a preliminary the accountants of both companies set to work to secure and carefully compare the respective assets of the Machine Company and also the liabilities, and it was found that, after a drastic depreciation of the assets of the Machine Company, about $7,000,000, its shares were then practically equal in value to the shares of the Electric Company, the common stock of each having an intrinsic value exceeding the par values.

"Conference was held November 15 between the committee of the Electric Company and myself and I was requested by the committee to submit in writing the verbal offer I had already made to exchange substantially all of the $7,300,000 stock of the Machine Company for the common stock of the Electric Company, par for par, which offer had been the subject of discussion at the conference on November 16. I submitted such a proposition in writing."

At a meeting of the Electric directors on November 20 the proposition was formally submitted, but was not approved, but Mr. Westinghouse says that immediately after the meeting "I was informed by its president that the Electric Company would give further consideration to the acquisition of the Machine Company and might in the near future have some offer to make. My chief motive in offering to part with my interest in the Machine, which is one of my important assets, was to bring about a union of the two companies on a basis which would be advantageous to each of them."

Mr. Westinghouse added that he believed that the controversies which had arisen under the management of the late chairman of the Electric Company could thus be definitely terminated on a basis which would give him, the founder of both companies, that voice in the affairs of the two companies which his experience and interest would warrant, and that under such circumstances he could bring about a great increase in the value of the Electric Company shares and make the proposed exchange of stock satisfactory to all parties.

Standard Underground Cable.

The regular annual meeting of the stockholders of the Standard Underground Cable Company will be held at the office of the company, Westinghouse building, Pittsburgh, January 23, to elect nine directors. The transfer books closed Saturday, January 13.

Dividends Announced.

CAMBRIA STEEL.—Regular quarterly 1¼ per cent, payable February 15, to stock of record January 31.

J. G. BRILL COMPANY.—Quarterly 1¾ on preferred, payable February 1.

MONONGAHELA RIVER COAL.—Annual, $2 on preferred, payable January 25.

CONSOLIDATED COAL.—Quarterly 1½, payable January 31.

PITTSBURGH TERMINAL WAREHOUSE COMPANY.—Monthly dividend, 18¾ cents a share, payable January 15 to stock of record January 15; increase of 3¾ cents a share.

DOMINION COAL.—Semi-annual 3½ on preferred, payable February 1.

TRIUMPH ELECTRIC (Cincinnati). — Quarterly 1¼ on preferred, payable January 15. Books closed January 11, opened January 16.

U. S. METAL PRODUCTS.—Quarterly 1¾ on preferred, payable February 10.

WESTINGHOUSE BRAKE COMPANY, LTD. (London).—Regular semi-annual 10 per cent and bonus of 5 per cent for the year.

Boiler makers' strike at Dunkirk (N. Y.) plant of American Locomotive Company was officially declared off January 13. It had been on since October 27.

INDUSTRIAL WORLD

Absorbed the
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PITTSBURGH, PA., JAN. 22, 1912.

The Carnegie Testimony.

POSSIBLY the STANLEY COMMITTEE, ostensibly investigating to see whether there has been a violation of law which the DEPARTMENT OF JUSTICE has not undertaken to prosecute, when the Department did bring suit against the STEEL CORPORATION October 26th last, was moved more by desire to write its own ideas into the official records than actually to obtain information from ANDREW CARNEGIE. If it were not so moved, its having MR. CARNEGIE before it as a witness has been an entire failure. MR. CARNEGIE not only gave the committee no important information, but showed both an unwillingness and an incapacity, though poor memory, to further the work of the committee.

A witness who gives inconclusive answers to questions of vital importance, relating to very important events in his life, is not a good witness. As a straw man of whom leading questions can be asked, he may be asuccess; and that is the best that can be said of the availability of MR. CARNEGIE as a witness.

Assuming, as we believe we are entitled to do, that the STANLEY COMMITTEE wished to use MR. CARNEGIE as a straw man of whom suggestive questions could be asked, we cannot give the committee credit for being moved only by a desire to get at the truth relative to the STEEL CORPORATION. For example, one of the points which it emphasized was that relating to the present SECRETARY OF STATE, HON. P. C. KNOX.. What the committee endeavored to develop in this connection was that MR. KNOX was a member of the firm that acted as counsel for the CARNEGIE STEEL COMPANY during the nineties, in which time the company was a party to a number of price agreements (which MR. GATES testified last June the company was always breaking), did not advise the company that the agreements were illegal, and was afterwards recommended by MR. CARNEGIE for ATTORNEY GENERAL in the McKINLEY administration.

The reference is simply politics, an effort to discredit the Republican party. The facts are that, at the farthest, the legality of the UNITED STATES STEEL CORPORATION is in doubt, while the illegality of those old price agreements is unquestionable, and most of those in question were entered into when a Democrat was the executive, with a Democratic cabinet. The duty of MR. KNOX was not to tell the CARNEGIE STEEL COMPANY how the law ought to be interpreted, but to advise it upon specific points, as to how this question or that question would likely be decided by the courts. There has been no evidence adduced that MR. KNOX or any other lawyer ever gave the company any legal advice as to the SHERMAN LAW. For political purposes, the question asked MR. CARNEGIE may possibly be used, but the fact is that there is no evidence. It is a historic fact that the pools or price agreements were not either successfully or even unsuccessfully maintained.

What the STANLEY COMMITTEE might do, if it wishes to proceed along the rational line to develop testimony as to what occurred in the nineties as to the CARNEGIE STEEL COMPANY, is to summon MR. A. R. PEACOCK, of Pittsburgh. For several years MR. PEACOCK was either general sales agent of the company or first vice president in charge of the selling branch of the business, and during his incumbency he was presumably the personal representative of the company in matters of prices. MR. PEACOCK'S memory is reputed to be good.

As for the value of MR. CARNEGIE'S testimony as testimony, the less said the better. For example, here comes a man who has made a wonderful success of the steel business—and to make a success of a business one is presumed to understand it and to have some kind of a memory. When asked whether he thought $28 was a fair price for rails, the man turns to his counsel and explains that he did so because "there might have been a boom at that time"—which would justify a high price. In other words, he asks his counsel whether the steel trade was experiencing a boom during the last year he was engaged in steel manufacture. He expressed surprise when told that the STEEL CORPORATION, when formed, issued $492,006,160 bonds against the CARNEGIE properties, declaring he did not know that was done, but not undertaking to deny the statement. The records all show that the issue was only $304,000,000, and that it was against all the properties.

To Encourage Building.

IT HAS been observed frequently in these columns, that the handicaps which Pittsburghers have discovered toward their city's progress are largely the creation of PITTSBURGH'S advantages, through the operation of that ever-present law of compensation—freight discriminations because PITTSBURGH shippers were so prosperous they could stand it, high land values because PITTSBURGH was growing so rapidly, high wage rates, because PITTSBURGH was a good place in which to engage in manufacturing and employ labor, and so on.

Directly in line with the general idea thus expressed, is the plan of the PITTSBURGH CIVIC COMMISSION with respect to taxation The Commission has just proposed that a new system be adopted, by taxing land at its full value and assessing only half taxes on buildings. The present assessed value of land in PITTSBURGH is practically double that of buildings. Hence, the present rate of 15 mills would yield to a system which would in effect levy 18 mills on land and nine mills on buildings. The actual method would be to assess the whole 18 mills on both, but to make the taxable value on buildings one-half the assessed value. Thus taxes on buildings would be reduced by six mills, from 15 mills to the equivalent of nine mills, while on land the tax would be increased from 15 to 18 mills.

Clearly such a system of taxation, while raising revenue just as easily as the present system, would tend to restrict the increase in land values, to encourage new construction, and to reduce rents. That is precisely what PITTSBURGH needs. It is PITTSBURGH'S great prosperity which has made the great increase in land valuations, and it is the extreme—perhaps undue—prosperity of some PITTSBURGH landowners which has conduced, as pointed out by the CIVIC COMMISSION, to the holding of large tracts of land with relatively minor improvements upon them.

Skyscrapers in PITTSBURGH have paid, yet they are scattered over the town with large areas in between, carrying hundreds and hundreds of three, four and five-story buildings, yet the land is the same, and held at the same valuations. The land is being carried, with these minor improvements, for a purpose. The

small buildings cannot possibly earn in rentals a fair return upon the valuation of the land. Suppose for argument that they do, then it follows that the land is really worth more, because with taller buildings it could be made to earn more. This land is being held, partially idle, for the purpose of giving the owners ultimately a greater price, by reason of an increment in earning power which it does not help to foster. A city does not prosper by reason of high land values; it prospers in spite of the high valuation. That is an evidence of prosperity, but not a cause of it. A city prospers by economies, by increases in facilities, and one way to make it prosper more is to encourage increases in facilities and discourage men from trying to make money without adding to the city's facilities, as is the case when men hold real estate without reasonable improvement upon it.

Proportionate to its size, PITTSBURGH has been a leader in the building of skyscrapers. The building of many-storied structures follows certain general principles, one important principle being that the greater the population of a city the more need there will be for skyscrapers, because there is more demand at its center for housing accommodations. Thus NEW YORK and CHICAGO should have built many more skyscrapers than PITTSBURGH, but having regard to size, PITTSBURGH led. It is absurd, however, for skyscrapers to be scattered here and there over a city. A reasonable development would be for the whole congested quarter to be built up to the same number of stories. Naturally, such a rule cannot be followed precisely, for story after story cannot be added to existing buildings as the city grows, but the rule could at least be followed at a distance, by the center filling with tall buildings first, and the area covered by such structures gradually extending. Thus far this has not been the case, for although for 15 years skyscrapers have been built in an important way there are still important corners in the heart of the city which are not so occupied.

The plan for half the taxes on buildings as on land may meet with much opposition, both because it is new and radical, and because it runs counter to the interests of a number of individuals; but it is economically sound, and if put in practice would undoubtedly greatly increase PITTSBURGH'S prosperity, not simply in the distant future, but beginning right away.

THE interests that are urging increased industrial expansion for PITTSBURGH district must look to hydro-electric power sooner or later. Last week, the INDUSTRIAL WORLD described some features of the splendid MCCALL'S FERRY plant, the finest in the State, designed eventually to supply power to BALTIMORE, PHILADELPHIA, WASHINGTON, HARRISBURG, LANCASTER, and other cities nearby. This week we devote an unusual amount of space to a description of the KEOKUK development on the MISSISSIPPI. This plant is designed to supply power, eventually, for 200 miles along the MISSISSIPPI VALLEY. Already, cities in that section are using the argument of cheap power in a campaign for new industries. SOUTHWESTERN PENNSYLVANIA thus far has one ambitious hydro-electric project, the KUHN enterprise on the CHEAT. How long before the ALLEGHENY, the MONONGAHELA or some of their tributaries will be studied intelligently for power possibilities? Coke oven and blast furnace by-product gas are not the only sources of cheap power PITTSBURGH DISTRICT has at her command.

Our Step Backward.

PRODUCTION of pig iron in the UNITED STATES and GERMANY compares as follows, the German production in 1911 being estimated from returns covering 11 months of the year:

	UNITED STATES Gross tons.	GERMANY Metric tons.
1880	3,835,191	2,719,038
1890	9,202,703	4,658,450
1900	13,789,242	8,520,540
1905	22,992,380	10,875,061
1906	25,307,191	12,292,819
1907	25,781,361	12,875,159
1908	15,936,018	11,805,320
1909	25,795,471	12,644,946
1910	27,303,567	14,227,455
1911	23,700,000	15,500,000

The relative production in the two countries has varied in an interesting way. Of course GERMANY was making iron before AMERICA was discovered, so that there was a long period of American production during which the German production was greater. Then the UNITED STATES forged ahead and passed GERMANY. In 1880, as may be observed from the above table, production in the UNITED STATES exceeded that of GERMANY by 40 per cent, while in 1890 the excess was 98 per cent. In 1900 the excess dropped to 62 per cent, but in 1905 we made 120 per cent more than GERMANY. In the nineties GERMANY had begun to grow at the AMERICAN gait, BRITISH production, by the way, being almost stationary, but a special burst of speed in the UNITED STATES distanced the German output. Since 1905 German production has been gaining at the previous German rate, but American production has been gaining relatively little, and thus it occurs that in the past five years, 1907 to 1911 inclusive, American production has been only 45 per cent in excess of German production. Whether our relative loss, or GERMANY'S relative gain, will continue until GERMANY resumes her ancient position of making more iron than we do, remains to be seen.

What is particularly striking in the comparison is the trend last year. GERMANY made a new production record, while production in the UNITED STATES fell behind that of four previous years, 1906, 1907, 1909 and 1910. From 1910 to 1911 German production increased 9 per cent, but production in the UNITED STATES decreased 13 per cent. That is something which those in control of the American iron industry need to explain and having explained it they need to study the explanation. We need an explanation but we do not want it simply in the form of an excuse.

It is not sufficient to say that the American iron trade has its ups and downs , and this was one of the downs. Were that a fair explanation the prospect would be blue, for what occurred last year could occur in still more aggravated form, and a year might come with a production much smaller still. If it be said on the other hand that the American production in some recent years was abnormally high, and that the country is making an average normal gain, then we shall have to sell our iron and steel at quite low prices for a number of years, because to give the UNITED STATES the same rate of gain as GERMANY from 1900 to the present would mean a production in the UNITED STATES in 1911 of 25,000,000 tons. Such a tonnage would show the same percentage gain over 1900 as was shown in the case of GERMANY. If 25,000,000 tons was all we had a right to expect in 1911, we cannot expect to engage our 34,000,000 tons capacity during any large portion of the next few years.

Twenty Years Ago.

INDICATIONS were very favorable for a heavy railroad consumption of iron and steel in 1892, according to an editorial review of the situation in our issue of January 22, 1892, an even 20 years ago. There had been a heavy grain movement, putting the railroads in funds, and important improvements would be needed to care for the coming WORLD'S FAIR traffic. At that time the postponement from 1892 to 1893 had not been decided upon. There had been heavy rail sales early in December, sales to the date amounting to 600,000 tons, against 200,000 tons to the same date in 1890 and 225,000 tons to the same date in 1889. Among the heavy orders placed for 1892 delivery were: PENNSYLVANIA RAILROAD, 70,000 tons; CHICAGO, BURLINGTON & QUINCY, 35,000 tons; CHICAGO & NORTHWESTERN, 40,000 tons; CHICAGO &

ROCK ISLAND, 16,000 tons; NORFOLK & [illegible] 5,000 tons. The 1892 orders were for heavier sections than formerly, 80 and 90-pound, and in some cases still heavier. The authorities made positive predictions that orders for cars and locomotives would be heavier for 1892 than for many years previous.

An editorial, "Labor Before the Law," says that much labor legislation had been passed in recent years, which "proves the tendency of the times is to protect the interests of labor in all practicable laws." The laws mentioned were all State laws, referring to establishment of boards of arbitration, limiting the hours of labor, forbidding blacklisting of employes, requiring certain frequency and promptness in paying labor, and so on. Doutless this "protecting the interests of labor," was regarded as going quite far in those days, but nowadays much more is expected. The labor unions, for instance, hardly regard compulsory arbitration as one of the main things they want.

Iron and steel imports in the 11 months ended November, 1891, amounted to 518,496 gross tons, of which 319,751 tons was tin plate, while in the same period ended in 1890 imports were 607,732 tons, tin plates amounting to 300,841 tons. Exports are not mentioned at all. The tonnage figures were not compiled at that time except perhaps in a very few lines.

A Leaky Roof at a Pumping Station.

[Cincinnati Enquirer.]

The valuable machinery in the Calierworks plant which cost several million dollars to install, is in danger of being ruined by water. The roof covering the plant is constructed of tile, and was only put on about five years ago, but the employes claim that from the first it has leaked like a sieve.

On several occasions, they informed Mayor Hunt and Directors Cash and Price, who visited the plant last Saturday, they were compelled to hang tarpaulins over the machinery to protect it from the rain and snow.

Mr. Cash stated last night that the men are discouraged at conditions that have obtained. The machinery is kept in apple-pie order, but their efforts are hardly of any avail, since if it rains just after they have cleaned and polished the machinery their work is undone. Mr. Cash had only words of praise for the efficient manner in which Superintendent Pollard and those under him have been conducting the plant. He said it will cost about $12,000 to reroof the building, and that this will have to be done immediately in order to save the machinery.

Charters to New Corporations.

[Additional Charters, Including Pennsylvania, West Virginia and Missouri, on Page v, Advertising Section.]

Indiana.

[illegible] Asphalt Paving Company, Kokomo; contractors; $20,000. W. J. Dixon, C. I. Brillhard and J. W. Coper.

Roth-Hamilton Manufacturing Company, [illegible] to manufacture steam engines; $10,000. H. C. Roth, J. M. Hamilton and Deliah Roth.

[illegible] Manufacturing Company, Anderson; to manufacture mechanical devices, especially an automobile starter; $50,000. W. S. Poling, G. J. Derthick, J. [illegible]ley, W. R. Poland and Mary A. Osborne.

[illegible]wood Tire & Equipment Company, Indianapolis; increase of capital from $0,000 to $21,000.

Starr Carriage Company, Huntingburg; notice of dissolution.

Opalescent Glass Works, Kokomo; change of name to Kokomo Opalescent Glass Works.

Western Construction & Engineering Company, Ft. Wayne; general contractors; $50,000. G. M. Hofmann, R. P. Hofmann, A. F. Stahlhut, C. S. Bash, C. J. Schwehn, Charles S. Bash and Frederick E. W. Scheiman.

George William Hoffman Company, Indianapolis; to take over the business of the United States Metal Polish Company, Indianapolis; $200,000. Emma Hoffman, A. V. Brown, W. T. Cannon, A. M. Graham and C. O. Britton.

G. Ittenbach Company, Indianapolis; $75,000; to deal in building stone and allied materials. J. B. Ittenbach, E. F. Dux and E. A. Siersdorfer.

Wilcox-Hoyt Manufacturing Company, Indianapolis; to manufacture electric devices for automobiles; $10,000. R. A. Wilcox, H. E. Wilcox and F. R. Hoyt.

International Pneumatic Wheel Company, Indianapolis; manufacturers; $100,000. W. H. Alford, W. S. Jackson, H. Dennis, Fletcher Johnson and R. R. Dennis.

The Hoosier City Boiler Manufacturing Company, Marion; $100,000. J. I. Stephenson, J. M. Browcher, J. A. Sabastiani, J. M. Stephenson and M. A. Downing.

New York.

McIntosh & Seymour Company, Auburn, N. Y.; manufacture machinery; $600,000. J. A. Seymour, William I. Ferry, William B. Morrison, Auburn, N. Y.

Albert J. Dowdeswell Company, Brooklyn; manufacture and deal in plumbing supplies, etc,; $10,000. Albert J. Dowdeswell, Carrie A. Dowdeswell, 838 Seventieth street; Milton R. Dowdeswell, 879 Seventieth street; Milton R. Dowdeswell, 133 Madison street, Brooklyn.

North Buffalo Hardware Foundry, Buffalo, N. Y., to do a general foundry and casting business, manufacturing hardware, etc.; $25,000. E. B. McKenna, W. A. Griffin, B. H. Prentice, Buffalo.

Ohio.

Davis Boat Works Company, Sandusky; $15,000; Adelbert B. Davis, Seth C. Davis, K. Louis Kelley, Roy H. Williams and George C. Steinemann.

Reynolds Manufacturing Company, Toledo; hardware; $50,000. John N. Reynolds, Samuel W. Reynolds, Charles F. Reynolds, William G. Nichols, Roberta Fitzpatrick.

Automatic Signal & Appliance Company, Cleveland; capital increased from $10,000 to $25,000; James B. Hoge, president, and N. G. Coe, secretary.

The Scioto Valley and New England Railroad Company, Columbus; capital reduced from $5,000,000 to $5,000; L. N Johnson, President, and M. H. Alden, secretary.

Billstone Metallic Company, Findlay, Ohio, metal castings, sheet metal and articles made therefrom; $5,000. J. B. Askey, F. J. Sargent, P. E. Hovis, H. P. Ferree.

Economy Bottle Case Company, Cincinnati: lumber, bottle carriers, boxes, etc.; $42,500, 850 shares of $50. Julius B. Ratterman, H. G. Ridgeway, Morgan Van Matre, Oscar W. Kuhn and Mary A. Mann.

Cincinnati Pick & Hardware Manufacturing Company, Cincinnati; manufacturing ice picks, ice tongs and hardware specialties; $5,000, 50 shares of $100 each. George Riehl, Catherine Riehl, Edna Riehl, Katherine Schutte, Theodore Zinke.

Sanitary Liquid Urn Company, Salem; manufacturing liquid urns; $5,000. K. S. Gaffner, W. A. Ball, C. P. Doyle, T. H. Ball, D. A. Warner.

Carrara Paint Company, Cleveland; manufacturing paints, oils, etc.; $5,000 L. R. Canfield, G. A. Howells, Ralph Blue, A. J. Pearson, J. L. Bradley.

Mitchell-Conner Manufacturing Company, Cincinnati, reversible windows and window devices; $25,000, 250 shares of $100 each. M. A. Beer, Emil A. Hauck, J. H. Ahlbrandt, Jr., Robert Rehn, A. B. Chisholm.

Earle G. Richards Hardware Company, Steubenville, general hardware; $25,000. Earl G. Richards, George Richards, H. J. Richards, J. H. Richards, M. Richards.

The Sanford Concrete Machinery Company, Toledo: increase of capital from $60,000 to $125,000. E. J. Long, president, and A. M. Abbott, secretary.

Beeman Dredging Company, Cleveland; dredging and general construction; $35,000. George W. Beeman, C. D. Sutton, M. M. Feidner, W. W. Myers and I. Noble.

The Portable Fire Escape & Manufacturing Company, Cleveland; portable fire escapes; $10,000. Alden E. Overholser, Nora L. Overholser, Isaac S. Overholser, Joseph C. Spohn and J. J. Hartman.

Pan-American Match Company; North Baltimore; manufacture of match ma-

chinery; $75,000; James P. Klotz, Clara H. Wideman, Robert F. Morrison, Samuel Cunningham and Frank P. Wideman.

Home Construction Company, Youngstown; increase of capital from $1,000 to $10,000; George E. Rose, president, and W. Edgar Leedy, secretary.

Illinois.

Iceless Ice Box Company, Chicago; manufacture refrigerating apparatus; $156,000. Incorporators: Thomas F. Burke, F. R. Kennedy, Charles D. Hank, Chicago.

Simplex Railway Appliance Company, Delaware corporation; manufacture railway supplies and rolling stock; $1,000,000. F. E. Patterson, 72 West Adams street, Chicago.

Central Illinois Utilities Company, Gilman; operate heat, light and power plants; $325,000. Harry J. Frith, H. A. Foster, R. C. Allen; all of Watseka, Ill.

Illinois Oil Gas Heating Company, White Hall; manufacture burners and heaters; $50,000. E. M. Prindle, Edwin S. White, George W. Prindle, all of White Hall.

Excelsior Motor Manufacturing & Supply Company, Chicago; manufacture automobiles and parts of same; $50,000. Ambrose A. Worseley, Marx Loehwing, Samuel W. Jockson; all of Chicago.

Watson Wagon Company, New York Corporation; manufacture wagons and parts of same; $600,000. E. G. Edwards, 607 Security building, Chicago.

Chicago Copper & Chemical Company, Chicago; manufacture and treating chemicals and ores; $150,000. Winthrop Coolidge, Charlies R. Foster, Frank A. Simmons; all of Chicago.

Thompson Manufacturing Company, Freeport; manufacture machinery, tools and novelties; $10,000. Clement E. Thompson, Louis Strohacker, Edward Strohacker; all of Chicago.

Wickes Brothers, Michigan Corporation; manufacture machinery, tools and implements; $1,000,000. Charles A. Eastman, 755 Monadnock Block, Chicago.

Drawn Metal Company, Michigan corporation; manufacture metal products; $10,000. Homer C. Chapin, 17 East Goethe street, Chicago.

Deforest Sheet & Tin Plate Company, Ohio corporation; selling steel and steel products; $400,000. W. M. Meyst, 838 First National Bank building, Chicago.

U. S. Rachet Wrench Company, Peoria; general manufacturing; $20,000. George Rediger, Louis Rediger, Chicago.

Ricketts-Bartley Range, Chicago; manufacture kitchen supplies; $10,000. John M. Bryant, Frederick Sass, Lyman M. Paine, Chicago.

Horst & Strister Company, Rock Island; manufacture motor vehicles; $10,000. Henry W. Horst, Henry T. Horst, Martin E. Strieter, Hugh E. Curtis, Rock Island.

A. E. Preuss Company, Utica; $6,000; manufacturing and selling cement products and building materials. Anton E. Preuss, Edmund Goodman, George A. Wilson, Jr.

Flat Creek Coal Company, Chicago; $10,000; mine and deal in coal and also to deal in other fuel. Edward D. Shurtleff, Henry P. Hetzer, Mary Schmitz.

Illinois Building Company, Chicago; $10,000; general building, contracting and construction business. Rupert J. Barry, Frank Venning, William A. Feeney.

John A. Wesche Company, $2,500; general contracting business. Joseph V. Crane, James D. Power, Raymond J. Cupler.

New Jersey.

National Safety Lock Company, Paterson, N. J. Manufacturing locks, hardware, etc.; $200,000. Mateo Tambirrini, Antonio Mattin, Frank Cacomaro, Antonio Caputo, all of Paterson.

United Motors Company, Camden, N. J., manufacturing automobiles, motors, etc.; $125,000. Marcus H. Carroll, William B. Macdonald, Harry Berger, all of Camden.

William P. Schaefer, Inc., Newark, N. J.; manufacturing galvanized iron and sheet metal goods; $125,000. William F. Schaefer, Mathilde Schaefer, Martin H. Donovan, all of Newark, N .J.

Essex Wrecking Company, Irvington, N. J., wrecking and destruction of buildings. Builders, contractors, etc.; $100,000. William Weidenbacher, 14 Myrtle avenue, Joseph Diebold, George D. Harrison, 2 Myrtle avenue, Irvington; Peter W. Lawrence, Vaux Hall, Union Township, N. J.

Delaware.

European Brush Machine Company, Wilmington, Del.; $100,000. Richard Tautenhahn, Curt. J. W. Weise, both of Philadelphia; George L. Townsend, of Wilmington.

Wilmington Iron & Metal Company, Wilmington, Del.; $10,000. E. C. Boyd, Eugene W. Stirlitth, Jr., both of Wilmington; Henry Rosenthal, of Philadelphia.

Iowa Short Line Railroad Company, Delaware Trust Company; $5,000,000. S. E. Robertson, M. L. Rogers, Harry W. Davis; all of Wilmington.

Hershey Light Company, United States Corporation Company; $50,000. H. O. Coughlan, Brooklyn; Welcome W. Bender, New York city; James W. Scatterfield, Dover, Del.

Delaware Horse Shoe Company, Wilmington, Del.; $100,000. John B. Niles, L. L. Dunham, Howard T. Wallace, all of Wilmington.

Simplex Specialties Company, Corporation Trust Company of America; $50,000. E. E. McWhiney, William J. Mahoney, Norman P. Coffin, all of Wilmington, Del.

Lake Erie & Ohio River Railway & Transportation Company, Delaware Charter Guarantee & Trust Company; $100,000. George H. Steigler, George W. Dillman, B. M. Grawl, all of Wilmington.

"No-Rust" Paint Company, The Delaware Fidelity Trust Company; $25,000. John A. Leary, Trovose, Pa., James F. Houghton, William C. Colburn, Philadelphia.

Hamerly Tool & Machine Company, Wilmington; $500,000. Edward C. Boiser, Francis B. Hamerly, Buffalo, L. Clark Raymond, Welland, Ont., Edwin R. Cochran, Jr., Wilmington.

Baltimore Blended Fuel Company, Delaware Corporation Company; $2,500,000. S. S. Adams, Jr., J. G. Gray, M. B. F. Hawkins, all of Wilmington.

Texas.

Briggs-Weaver Machinery Company, Dallas, filed amendment increasing its capital [illegible]

Texas Motor & Supply Company of Victoria, filed an amendment increasing its capital stock from $3,000 to $15,000.

CONVENTIONS SCHEDULED FOR THE COMING YEAR.

[illegible] York, January 23-28.

[illegible] —New York, January 30-31. R. Dinsmore, Wilmington, Del.

[illegible] chester, N. Y., week of February 5. Samuel F. Haserot, Haserot Canning Company, Cleveland.

ENGINE & BOAT MANUFACTURERS. — New York (Sixty-ninth Regiment Armory), February 17-24.

CANADIAN MINING INSTITUTE.—Toronto, March 6, 7, 8, 9.

NATIONAL BRICK MANUFACTURERS.—Chicago, March 6-9. T. A. Randall, Indianapolis.

NATIONAL PAVING BRICK MANUFACTURERS. Chicago, March 4. W. P. Blair, Locomotive Engineering building, Cleveland.

AMERICAN CERAMIC SOCIETY. — Chicago, March 4-6. Edward Orton, Jr., O. S. U., Columbus, O.

AMERICAN BUILDING BRICK ASSOCIATION.—Chicago, March 6. J. Parker Fiske, Flatiron building, New York.

NATIONAL CLAY MACHINERY ASSOCIATION. Chicago, March 7-12. W. N. Durbin, Anderson, Ind.

SUPPLY MEN'S ASSOCIATION OF BOILER MANUFACTURERS (U. S. and Canada)—St. Charles Hotel, New Orleans, March 11-14.

RAILWAY ENGINEERING ASSOCIATION.—Chicago, March 19-21. E. H. Fritch, Monadnock block, Chicago.

AMERICAN SUPPLY & MACHINERY DEALERS' ASSOCIATION. — Norfolk, Va., May 13-15. F. D. Mitchell, 309 Broadway, New York.

MASTER BOILER MAKERS' ASSOCIATION.—Pittsburgh, May 14-17, 1912. Harry D. Vought, 95 Liberty street, New York.

OHIO SOCIETY MECHANICAL, ELECTRICAL & STEAM ENGINEERS. — Pittsburgh, May 16, 17, 18. F. E. Sanborn, Columbus.

RAILWAY STOREKEEPERS. — Buffalo, May 20-22.

AMERICAN HARDWARE MANUFACTURERS' ASSOCIATION AND SOUTHERN HARDWARE JOBBERS' ASSOCIATION.—Nashville, Tenn., May 28-31.

RAILWAY INDUSTRIAL ASSOCIATION.—Kansas City, May 12. G. L. Stewart, St. L. S. W. Railway, St. Louis.

AIR BRAKE ASSOCIATION.—Richmond, Va., May 7-10. F. M. Nellis, 53 State street, Boston.

MASTER CAR BUILDERS. — Atlantic City, June 12-14. J. W. Taylor, Chicago.

RAILWAY MASTER MECHANICS.—Atlantic City, June 17-19. J. W. Taylor, Old Colony building, Chicago.

RAILWAY SUPPLY MANUFACTURERS. — Atlantic City, June 17-19, 1912. J. D. Conway, 2135 Oliver building, Pittsburgh.

RAILWAY BRIDGE & BUILDING ASSOCIATION. —Baltimore, October 15-17. C. A. Lichty, C. & N. Railway, Chicago.

Market Conditions in Pig Iron.

THE LOCAL MARKET.

Consumers Play a Waiting Game in Pig Iron.

PITTSBURGH.—Consumers are not buying heavily for second quarter, considering the outlook in the ore and freight rate situations uncertain. Large prompt tonnages changed hands—No. 2 foundry iron in 1,000 to 2,000-ton lots bringing $13.25 Valleys on several sales, while 1,000 tons of standard malleable was closed at $13 Valleys. The sale of 1,000 tons of off-analysis malleable at $12.45, Valleys, was carwheel iron.

It is understood Pittsburgh Steel Company has bought its February supply of basic iron, 10,000 to 14,000 tons, from the Crucible Steel Company's Midland plant, at about the same terms involved in the January transaction, a shade less than $12.50 at furnace. Tonnages of prompt and first quarter Besemer, in 1,000 to 2,000-ton lots show a firm price of $14.25 Valley furnace. Furnaces are firmer in quoting No. 2 iron for forward delivery, general asking price being $13.50 Valleys. Unfavorable weather has cut down output figures somewhat.

Dull Situation at Seaboard.

NEW YORK.—The week saw little improvement in the dull situation of the pig iron market. There were a number of sales, but all were of small lots. Inquiries were in a few cases for more than 1,000 tons. Of the inquiries of large consumers that were made during the last two weeks, the principal interest was taken in the 5,000 ton inquiry by a pump concern. This was closed Wednesday. Export business on European account is reported as being under negotiation. The majority of the Canadian inquiries have been satisfied. The market was steady, but devoid of features. Prices are firm. Buffalo is asking $13.75 for second quarter. Most furnaces in that district are pretty well filled up for the first three months. The scarcity of ferro-manganese in the New York market is becoming more serious with each day. The steamer Amania, on which metal to relieve the situation was expected, is overdue more than four weeks. If the spot situation is not relieved within a few days there will be a premium market.

Prices Unchanged at Philadelphia.

PHILADELPHIA.—The week was uneventful. There are inquiries in the market for between 6,000 and 7,000 tons. Some of the firms have been marketing for more than two weeks. One house which usually does about 5,500 tons a week says that during the past week it has hold only about 1,400 tons. Prices as a whole are unchanged, though Virginia quotations have stiffened slightly.

Falling Off in Southern Output.

BIRMINGHAM.—Pig iron production in January will show a falling off as compared to the previous two months, two or three furnaces being out of commission pending repairs. It is not believed the accumulated stock of iron will be worked off, however, under six months' time. The quotations for pig iron in the Southern territory range between $10 and $10.50 per ton. The Alabama Consolidated Coal & Iron Company will blow in one of its Ironton blast iron furnaces, put out for repairs recently, before the middle of next month. Sloss-Sheffield expects to blow out one of its North Birmingham furnaces, and will start one at the same place within the next three weeks.

While there is some operation at the steel plants in the Southern territory, the speed that was expected has not been reached as yet. Very little is being said about new business. There is no change in conditions at machine shops and foundries. The cast-iron pipe works are melting a good quantity of pig iron right along and are shipping their product as rapidly as it is being manufactured. Good prices obtain for cast iron pipe.

Crude and Finished Steel Products.

RUMORS OF WIRE ADVANCE.

Persistent Reports That $1 a Ton Will Be Added.

PITTSBURGH.—Reports persist that an official advance of $1 a ton will be announced in wire and wire products before February 1, and there is a disposition on the part of some mills to withdraw the prices of $1.55 for wire nails, and $1.35 for plain wire, to jobbers in carload lots at mill.

In sheets, there have been rumors of slight shading in the past few days. The majority of producers, however, are firm in their views, 1.90c and 2.90c, while it is even reported that on corrugated material slightly above the corresponding prices are being asked by one or two of the larger producers. Buying further ahead is a feature of the sheet steel trade.

Scarcity of Prompt Coke.

PITTSBURGH.—A scarcity of prompt coke drove prices for spot furnace delivery up from $1.80 to $1.90, $2 and in extreme cases $2.20. It was the most remarkable week's trading in 12 months in the scarcity of prompt tonnages. With moderating weather conditions shipments came out more freely. Contracts for first half are made on the basis of $1.80 to $1.90, some producers asking $2. Charges are being made that some operators are taking coke which they should ship on contract, and disposing of it in the spot market, on account of being able to secure 20 or 30 cents per ton more.

Western Retail Implement Dealers' Association was in session at Kansas City last week.

RAILROADS' WAITING GAME.

N. Y. Central's Rail Order Not Up to Expectations.

NEW YORK. — The New York Central's rail order, 115,000 tons, fell short of expectations, it having been expected that the order would total 180,000 tons.

It is thought this small commitment at this time means that the same system will come in with an additional order before the close of the spring.

Of the total, 60,000 tons went to the Steel Corporation, the remainder to Lackawanna. On the latter part of this order, a considerable tonnage is specified in ferro-titanium rails.

The Pennsylvania Company rail order is understood to be undergoing alterations in specifications from those originally made up by the rail committee. The Erie inquiry also is still pending. The only considerable tonnage announced during the week aside from New York Central was 3,500 tons for the Chicago Junction Railway, the order going to the United States Steel Corporation.

Car orders reported included 3,000 freight cars for the Rock Island and 500 steel gondolas for the Northern Pacific; the latter has pending on order for 5,000 freight cars and the Atchison is preparing to place an order for 8,000 cars.

Structural circles are quiet, no really large contracts or inquiries having been noted for two weeks. The Canadian Pacific's new shops at Calgary will require 3,500 tons of steel, the order having been divided between the Canadian Steel Company and the Canadian Bridge Company. The denial of plans for a new

Equitable building, New York, at least along the pretentious lines suggested some days ago, removes from calculations a problematical 25,000 tons. The Hedden Iron Construction Company was the lowest bidder for 500 tons for the Central Railroad of New Jersey's new pier.

THE COKE MARKET.

Zero Weather Affects Output—Crazy Spot Market as Result of Scarcity.

CONNELLSVILLE. — The production of coke for the Connellsville region for the week ending January 13, was 391,432 tons, which compares with 318,432 tons for the week ending December 16. This is the highest week's total in more than a year. The "Courier's" comparative figures for two weeks show:

Coke Produced By—	Week Ending Jan. 6	Jan. 13
Furnace interests (tons)	185,256	247,060
Merchant ovens (tons)	137,650	144,372
Total output (tons)	322,906	391,432
Active ovens	28,093	29,230
Shipments (cars)	9,095	9,314

The total of 29,390 ovens active compares with 26,014 active ovens on December 9. Of the prospects, the "Courier" says in the current issue:

Within the past three weeks over 4,000 idle ovens have been ordered into blast, but they have been unable to get to their productive capacity because of the necessary delay in supplying on so short a notice the complement of men. This complement is a small industrial army aggregating between four and five thousand men. The extreme cold weather has also been a serious handicap. The railroads have plenty of equipment for the movement of Connellsville coke, but during zero weather or worse were not able to haul normal capacity, while wrecks and other weather reasons contribute materially to the obstruction of traffic.

Though prices are very much better they are not what the operators think they should be, and after the freight rate case is disposed of it is possible that this matter may again be taken up seriously. * * * * The furnace ovens showed an increase of 32,891 tons, while the merchant ovens fell off 8,529 tons, the showing in both instances being due in part to the transfer of the Colonial plants of the Frick Coke Company from the merchant to the furnace column.

Cincinnati Skyscraper Contract.

CINCINNATI.—Union Central Life Insurance Company has let general contract for new 19-story skyscraper on Chamber of Commerce site, this city, to Thompson-Sterrett Company. The plans call for 6,000 tons of steel.

Track Supplies for N. Y. Central.

PHILADELPHIA.—New York Central has placed a large tonnage of frogs and switches with Pennsylvania Steel Company, to be rolled at Steelton plant.

RECENT PATENTS

The following patents, granted to January 9, 1912, are reported expressly for the Industrial World, by Siggers & Siggers, patent attorneys, Suite No. 30, National Union building, Washington, D. C.:

1,014,432—Elmer P. Alexander, Lewistown, Pa., improvements in method of manufacturing hoes, the object being to overcome the defects of prior processes of manufacturing hoes and to provide a method by means of which the hoe eyes may be properly set, shaped, backed up and otherwise firmly connected with the blade. It consists in forming a blade portion having a semi-circular recess in one edge, an eye portion provided with a rough or unfinished eye, and a web, then heating and assembling these parts, crudely or temporarily welding the portions together with the side of the eye abutting the wall of the recess in the blade, and finally inserting a mandrel in the rough eye to expand it and cause it to fill the recess in the blade and simultaneously apply pressure to firmly weld the parts and spread the web.

1,014,425—William R. Walker, New York, improvements in manufacture of steel. This invention consists of removing the carbon of pig iron to a substantially definite percentage, then recarbonizing to a sufficient extent to lessen skulling during transfer, and then transferring the metal to and treating it in an electric furnace.

1,014,051—Charles E. DeLong, Dallas, Texas, improvements in attachment for lathe head-stocks, assigned to H. H. Hawley Company, Dallas, Texas. The invention has for its object the perfecting of a device that may be readily adjusted to furnish a backing or "set" for work of any diameter that may be gripped by the chucks of a jeweler's or watchmaker's lathe. There is an elongated stem, divergent resilient wires, a flange contacting with the wires, and means limiting the sliding motion of the sleeve toward the wire extremities.

The following patents, granted to January 16, are reported expressly for the Industrial World, by J. M. Nesbit, patent attorney, Park building, Pittsburgh, Pa., from whom printed copies may be procured for 15 cents each:

Method of and apparatus for producing compound metal ingots, F. E. Canda, New York, assignor to Chrome Steel Works, Chrome, N. J.; exhaust valve mechanism, C. T. Denker, Chicago; device for creating a draft through smoke stacks, J. D. McKay, St. John, New Brunswick, Canada; safety device for blast furnaces, S. B. Shutts and William McHugh, Joliet, Ill.; rotary engine, G. P. Herrick, New York; rotary engine, Andrew McCormick, Chicago Heights, Ill.; measuring instrument, P. N. Killinger, Pittsburgh; grinding machine, O. J. Johnson, Wheeling, W. Va.; turbine, N. B. Wales, Boston, Mass., and G. B. Collier, Kinderhook, N. Y.; rotary engine, Benjamin Dahl, Minneapolis, Minn.; gas producer, C. M. Garland, Collingswood, N. J., assignor to Camden Iron Works, Camden, N. J.; manufacture of steel, W. R. Walker, New York; charging car and other receptacle, G. K. Hampfeldt, Kneuttingen, Germany; welded wrought iron annealing pot, E. T. Lammine, Mulheim-on-Rhine, Germany; armor plate, J. N. Papendry, East Liverpool, Ohio; mechanical stoker, R. F. Stewart, Omaha, Neb.; method of making expanded metal structures (2) H. E. White, Youngstown, Ohio, assignor to General Fireproofing Company, same place; three-high-roll mill, C. L. Taylor, Alliance, Ohio, assignor to Morgan Engineering Company, same place; turbine blade, George Westinghouse, Pittsburgh; coating with metal, C. F. Burgess, Madison, Wis., assignor to United States Sherardizing Company, New Castle, Pa.; furnace feeding apparatus, F. H. Treat, Cleveland; handling, unloading, storing, and re-loading plant, H. P. Andersen, Chicago; machine for turning crank-pins, Jacob Kessler and John Weiss, Pittsburgh; process for making expanded metal, W. D. Forsyth, Youngstown, Ohio.

INDUSTRIAL FIRES.

Butler, Pa.—Slab mill of Forged Wheel Company, a Standard Steel Car subsidiary, damaged $10,000 January 13. Some machinery partially wrecked.

* * *

Birmingham, Ala.—Cable piano factory and Southern Bell Telephone buildings destroyed January 14; loss $250,000.

* * *

St. Louis.—St. Louis Bag & Burlap Company, 325 North Main street, destroyed January 13; damage to building and contents $70,000. Norvell-Shapleigh Hardware Company sustained smoke and water loss.

* * *

Trenton, Mich.—New Aetna Cement Company's plant damaged $100,000 on January 13.

New Plant in the South.

It is announced at Birmingham, Ala., that the American Radiator Company, which is now operating a leased plant, will erect a large works of its own, one that will give employment to several hundred men.

Range of Weekly Quotations of Pig Iron

PIG IRON At Pittsburgh—	Jan. 20.	Jan. 13.	1912. Jan. 6.	1911. Dec. 30	Dec. 23.	Dec. 16.	Dec. 9.
Bessemer	15.15	15.15	15.15	15.15	15.15	15.15	15.15
Basic	13.40@13.65	13.40@13.90	13.40	13.40	13.40	13.40	13.40
No. 1 Foundry	14.90	14.90	14.90	14.50	14.50	14.50	14.50
No. 2 Foundry	13.90@14.40	13.90@14.40	13.90@14.15	13.90@14.15	13.90@14.15	13.90@14.15	14.15
Malleable	13.65@13.90	13.65@13.90	13.65	13.65	13.65	13.65	13.40@13.65
Gray Forge	13.40@13.65	13.40@13.65	13.40@13.65	13.40@13.65	13.40@13.65	13.40	13.40@13.65
Low Phosphorus	21.00@22.00	21.00@22.00	21.00@22.00	21.00@22.00	21.00@22.00	21.00@22.00	21.00@22.00
Ferro Silicon, 50 per cent.	70.00	70.00@71.00	70.00	70.00	70.00	68.00@70.00	65.00@66.00
Ferro Silicon, 10 per cent.	22.90@23.90	22.90	22.90@23.90	22.90@23.90	22.90@23.90	23.90	23.90
Silicon Spiegel, 10 to 12 per cent.	23.40@24.90	23.40@24.90	24.40	24.40	24.40	24.40	24.90
Spiegeleisen	21.50@22.50	21.50@22.50	21.50@22.50	21.50@22.50	21.50@22.50	21.50@22.50	21.50@22.50
Ferro Manganese	42.70@42.95	[illegible]	41.95	41.95	40.45	40.45	39.45@40.45
At Virginia Furnaces—							
Basic	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. 1 X	13.00	13.00	13.00	12.75	12.75	12.75	12.75
No. 2 X	12.25@12.50	12.25@12.50	12.25@12.50	12.25	12.25	12.25	12.25
No. 2 Plain	12.00@12.50	12.00@12.50	12.00@12.50	12.00@12.25	12.00@12.25	12.00@12.25	12.00@12.25
Gray Forge	12.00	12.00	12.00	12.00	12.00	12.00	12.00
At Birmingham—							
No. 1 Foundry	10.75@11.00	10.75@11.00	10.75@11.00	10.75@11.00	10.75@11.00	10.50	10.50
No. 2 Soft	10.00@10.50	10.00@10.50	10.25@10.50	10.00@10.50	10.00@10.25	9.75	9.75
No. 2 Foundry	10.00@10.50	10.00@10.50	10.25@10.50	10.00@10.50	10.00@10.25	9.75	9.75
No. 3 Foundry	9.50@9.75	9.50@9.75	9.50@9.75	9.50@9.75	9.50@9.75	9.50@9.75	9.50@9.75
No. 4 Foundry	9.50	9.50	9.50	9.50	9.50	9.50	9.50
Gray Forge	9.25@9.50	9.25@9.50	9.25@9.50	9.50	9.50	9.50	9.50
At Philadelphia—							
No. 2X Foundry	15.00@15.25	15.00@15.25	15.00@15.25	15.00@15.25	15.00@15.25	15.00@15.25	15.00@15.25
Basic	14.50	14.50	14.50	14.50	14.50	14.50	14.50
Gray Forge	14.25@14.50	14.25@14.50	14.25@14.50	14.25@14.50	14.25@14.50	14.25@14.50	14.25@14.50

STEEL. Tons of 2240 lbs., at Pittsburgh—							
Bessemer Billets	29.00	29.00	29.00	29.00	19.00@19.50	19.00@19.50	19.00@19.50
Open Hearth Billets	29.00	29.00	29.00	29.00	19.00@19.50	19.00@19.50	19.00@19.50
Forging Billets	27.00@28.00	26.00@28.00	26.00@28.00	26.00	25.00	24.00@25.00	24.00@25.00
Sheet and Tin Bars	21.00	21.00	21.00	21.00	20.00@21.00	20.00@20.50	20.00@20.50
Bessemer Steel Rails	28.00	28.00	28.00	28.00	28.00	28.00	28.00
Open-Hearth Steel Rails	30.00	30.00	30.00	30.00	30.00	30.00	30.00
Light Steel Rails—							
25 to 45 lbs.	25.00@26.00	25.00@26.00	25.00@26.00	25.00@26.00	25.00@26.00	25.00@26.00	25.00@26.00
16 and 20 lbs.	26.00@27.00	26.00@27.00	26.00@27.00	26.00@27.00	26.00@27.00	26.00@27.00	26.00@27.00
12 and 14 lbs.	28.00	28.00	28.00	28.00	28.00	28.00	28.00
8 lbs.	28.00	28.00	28.00	28.00	28.00	28.00	28.00
Bessemer Wire Rods	24.50@25.00	24.00@25.00	24.50@25.00	24.50@25.00	25.00	25.00	25.00
Open Hearth Wire Rods	24.50@25.00	24.00@25.00	25.00	25.00	25.00	25.00	25.00
Muck Bar, all pig iron	28.00@28.50	28.00@29.00	28.00@29.00	28.00@29.00	28.00@28.50	27.00@28.00	27.00@28.00

FINISHED PRODUCTS. Tons of 2000 lbs., at Pittsburgh—							
Skelp Steel Grooved	23.50@24.00	23.50@24.00	23.50@24.00	23.50@24.00	23.50@24.00	23.50@24.50	23.50@24.50
Skelp Steel Sheared	24.00@24.50	24.00@24.50	24.00@24.50	24.00@24.50	24.00@24.50	24.00	24.00
Railroad Spikes	28.00	28.00	28.00	28.00	28.00	28.00	28.00
Sheets, No. 28	38.00@40.00	38.00@40.00	38.00@40.00	38.00	38.00	37.00@38.00	37.00@38.00
Galvanized Sheets, No. 28	58.00@60.00	58.00@60.00	58.00@60.00	58.00	58.00	57.00@58.00	57.00@58.00
Tank Iron 3 to 15 inches	25.00@26.00	25.00@26.00	25.00@26.00	25.00@26.00	25.50@26.00	25.50@26.00	25.50@26.00
Beams, over 15 inches	26.50@27.00	26.50@27.00	26.50@27.00	26.50@27.00	26.50@27.00	26.50@27.00	26.50@27.00
Angles, 3 to 15 inches	25.00@26.00	25.00@26.00	25.00@26.00	25.00@26.00	25.50@26.00	25.50@26.00	25.50@26.00
Channels, over 15 inches	26.50@27.00	26.50@27.00	26.50@27.00	26.50@27.00	26.50@27.00	26.50@27.00	26.50@27.00
Tees, 3-inch and larger	25.00@26.00	25.00@26.00	25.00@26.00	25.00@26.00	25.50@26.00	25.50@26.00	25.50@26.00
Zees, 3-inch and larger	26.50@27.00	26.50@27.00	26.50@27.00	26.50@27.00	26.50@27.00	26.50@27.00	26.50@27.00
Angles, 3 to 6 inches	25.00@27.00	25.00@27.00	25.00@27.00	25.00@27.00	25.00@27.00	25.00@27.00	25.00@27.00
Angles, over 6 inches	25.00@26.00	25.00@26.00	25.00@26.00	25.00@26.00	25.50@26.00	25.50@26.00	25.50@26.00
Tank Plate	24.00@26.00	24.00@26.00	24.00@26.00	24.00@26.00	24.00@26.00	24.00@26.00	24.00@26.00
Boiler Plate	25.00@27.00	25.00@27.00	25.00@27.00	25.00@27.00	25.00@27.00	25.00@27.00	25.00@27.00
Universal	25.00@26.00	25.00@26.00	25.00@26.00	25.00@26.00	27.00	27.00	27.00
Shafting	23.00@24.00	23.00@24.00	23.00@24.00	23.00@24.00	23.00@24.00	23.00@24.00	23.00@24.00
Bessemer Steel Bars	23.00@24.00	23.00@24.00	23.00	23.00	23.00	22.00@23.00	22.00@23.00
Open Hearth	23.00@24.00	23.00@24.00	23.00	23.00	23.00	22.00@23.00	22.00@23.00
Common Iron Bars	25.50@26.00	26.00	25.00	25.00	25.00	24.00	24.00

and Various Finished Iron and Steel Products.

Dec. 2.	Nov. 25.	Nov. 18.	Nov. 11.	Nov. 4.	Oct. 28.	Oct. 21.	Oct. 14.	Oct. 7.	1911. Jan. 21.
15.15@15.40	15.15@15.40	15.15@15.40	15.15@15.40	15.15@15.40	15.40	15.40	15.55	15.55	15.90
13.40	13.40	13.40	13.40	13.40	13.40	13.40	13.40@13.65	13.50	14.40
14.75	14.75	14.75.	14.75	14.75	14.75	14.75	14.75	14.75	15.15@15.40
14.15@14.40	14.15	14.00@14.15	14.15@14.40.	14.15@14.40	14.40	14.40	14.40	14.15	14.65@14.90
13.40	13.40	13.50@13.70	13.40	13.40@13.90	13.90	13.90@14.00	13.90@14.15	13.90@14.15	14.40
13.40@13.65	13.40	13.40	13.40@13.50	13.40@13.65	13.65	13.65	13.40@13.90	13.40@13.90	14.15@14.40
21.00@22.00	21.00@22.00	21.00@22.00	21.00@22.00	21.00@22.00	21.00@22.00	21.50@22.50	21.50@22.50	21.50@22.50	20.00
65.00@66.00	65.00@66.00	64.00@65.00	64.00	60.00@62.00	59.00@60.00	58.50@60.00	58.00@59.50	57.00	54.50@55.50
23.90	23.90	23.90	23.90	23.90	23.90	23.90	23.90@24.90	24.90@25.90	24.90
24.90	24.90	24.90@25.90	24.90@25.90	24.90	24.90	25.90	25.90@26.90	25.90@26.90	25.00@26.00
21.50@22.50	21.50@22.50	21.50@22.50	21.50@22.50	21.50@22.50	22.50@23.50	23.50@25.50	23.50@25.50	23.50@25.50	23.90@25.90
39.45@40.45	39.45@40.45	39.95@40.45	39.95@40.45	38.95@40.45	38.95@40.15	38.65@38.95	38.95@40.45	38.95@40.45	40.45
12.00	12.00	12.00	12.00	12.25@12.50	12.25@12.50	12.25@12.50	12.25@12.50	12.25@12.50	12.50@13.00
12.75	12.75	12.75	12.75	12.75	12.75	12.75	12.75	12.75	13.75@14.00
12.25	12.25	12.25	12.75	12.25@12.50	12.25@12.50	12.25@12.50	12.25@12.50	12.25@12.50	12.50@13.00
12.00@12.25	12.00@12.25	12.00@12.25	12.00@12.25	12.25@12.50	12.25@12.50	12.25@12.50	12.25@12.50	12.25@12.50	12.50@13.00
12.00	12.00	12.00	12.00	11.75	11.75	11.75	11.75	11.75	11.75@12.25
10.50	10.50	10.50	10.50	10.50	10.50	10.50	10.50	10.50	12.50@13.00
9.50@10.00	10.00	10.00	10.00	10.00	10.00@10.25	10.00@10.25	10.00@10.50	10.00	10.75@11.00
9.50@10.00	10.00	10.00	10.00	10.00	10.00@10.25	10.00@10.25	10.00@10.50	10.00	10.75@11.00
9.00@9.75	9.50@9.75	9.50@9.75	9.50@9.75	9.50@9.75	9.50@10.00	9.50@10.00	9.50@10.00	9.50@10.00	10.50@11.00
9.50	9.50	9.50	9.50	9.50	9.50	9.50	9.25@9.50	9.50@10.00	10.25@10.75
9.50	9.50	9.50	9.50	9.50	9.50	9.50	9.50@10.00	9.25@9.50	9.75@10.00
15.00@15.25	15.00@15.25	15.00@15.25	15.00@15.25	15.00@15.25	15.00@15.25	15.00@15.25	15.00@15.25	15.00@15.25	15.50
14.50	14.50	14.50	14.50	14.25@14.75	14.25@14.75	14.25@14.75	14.50@14.75	14.50@14.75	14.25@14.75
14.25@14.50	14.25@14.50	14.25	14.25	14.00@14.25	14.00@14.25	14.00@14.25.	14.00@14.25	14.00@14.25	14.00@14.25

19.00@19.50	19.50@20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	23.00
19.00@20.00	19.00@20.00	19.00@20.00	20.00	20.00	19.00	19.00	19.00@19.50	19.00	23.00
24.00@25.00	24.00	24.00	24.00	24.00	24.00	24.00	25.00	25.00	27.50@28.00
19.50@20.50	20.00@20.50	20.00@21.00	20.00@21.00	20.00@21.00	20.00@21.00	20.00@21.00	20.00@21.00	20.00@21.00	24.00
28.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00	**28.00**
30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	**30.00**
25.00@26.00	25.00@26.00	25.00@26.00	25.00@26.00	25.00@26.00	25.00@26.00	25.00@26.00	25.00@26.00	25.00@26.00	25.00@26.00
26.00@27.00	26.00@27.00	26.00@27.00	26.00@27.00	26.00@27.00	26.00@27.00	26.00@27.00	26.00@27.00	26.00@27.00	26.00@27.00
28.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00	**28.00**
28.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00	29.00
25.00	25.00	25.00@25.50	26.00	26.00	26.00	26.00	26.00@26.50	26.00@26.50	27.50@28.00
25.00	25.00	25.00@26.00	26.00	26.00	26.00	26.00	26.00@26.50	26.00@26.50	27.50@28.00
28.00@29.00	28.00@29.00	28.00@28.50	28.00@28.50	28.00@28.50	28.00@28.50	28.00@28.50	28.00@28.50	28.00@28.50	29.00

23.00@23.50	23.00@23.50	23.00@23.50	25.00	25.00	25.00	25.00	25.00	25.00	25.00
23.50@24.00	23.50@24.00	23.50@24.00	27.00	27.00	27.00	27.00	27.00	27.00	26.00@27.00
28.00	28.00	28.00	28.00@29.00	28.00@29.00	28.00@29.00	28.00@29.00	28.00@29.00	28.00@29.00	29.00@31.00
37.00@38.00	37.00@38.00	37.00@38.00	37.00@38.00	37.00@38.00	37.50@38.00	37.00@38.00	37.00@40.00	37.00@40.00	44.00
57.00@58.00	57.00@58.00	57.00@58.00	57.00@58.00	57.00@58.00	57.00@58.00	57.00@58.00	58.00@60.00	58.00@60.00	62.00@64.00
25.50@26.00	25.50@26.00	25.50@26.00	25.50@26.00	25.50@26.00	25.50@26.00	25.50@26.00	25.50@26.00	25.50@26.00	28.00
26.50@27.00	26.50@27.00	26.50@27.00	26.50@27.00	26.50@27.00	26.50@27.00	26.50@27.00	26.50@27.00	26.50@27.00	29.00
25.50@26.00	25.50@26.00	25.50@26.00	25.50@26.00	25.50@26.00	25.50@26.00	25.50@26.00	25.50@26.00	25.50@26.00	28.00
26.50@27.00	26.50@27.00	26.50@27.00	26.50@27.00	26.50@27.00	26.50@27.00	26.50@27.00	26.50@27.00	26.50@27.00	29.00
25.50@26.00	25.50@26.00	25.50@26.00	25.50@26.00	25.50@26.00	25.50@26.00	25.50@26.00	25.50@26.00	25.50@26.00	28.00
26.50@27.00	26.50@27.00	26.50@27.00	26.50@27.00	26.50@27.00	26.50@27.00	26.50@27.00	26.50@27.00	26.50@27.00	29.00
25.00@27.00	25.00@27.00	25.00@27.00	25.00@27.00	25.00@27.00	25.00@27.00	25.00@27.00	25.00@27.00	25.00@27.00	28.00
25.50@26.00	25.50@26.00	25.50@26.00	25.50@26.00	25.50@26.00	25.50@26.00	25.50@26.00	25.50@26.00	25.50@26.00	29.00
24.00@26.00	24.00@26.00	24.00@26.00	24.00@26.00	24.00@26.00	24.00@26.00	24.00@26.00	24.00@26.00	24.00@26.00	28.00
25.00@27.00	25.00@27.00	25.00@27.00	25.00@27.00	25.00@27.00	25.00@27.00	25.00@27.00	25.00@27.00	25.00@27.00	**30.00**
27.00	27.00	27.00	27.00	27.00	27.00	27.00	27.00	27.00	29.00@30.00
23.00@24.00	23.00@24.00	23.00@24.00	23.00@24.00	23.00@24.00	23.00@24.00	23.00@24.00	23.00@24.00	23.00@24.00	28.00@29.00
22.00@23.00	22.00@23.00	22.00@23.00	22.00@23.00	22.00@23.00	22.00@23.00	22.00@23.00	22.00@23.00	23.00@24.00	28.00
22.00@23.00	22.00@23.00	22.00@23.00	22.00@23.00	22.00@23.00	22.00@23.00	22.00@23.00	22.00@23.00	24.00@25.00	28.00
24.00	24.00	24.00	24.00@25.00	24.00@25.00	24.00@25.00	24.00@25.00	24.00@25.00		27.00

Detail Prices on Finished Product in Iron and Steel.

STEEL PLATES.

Base prices, tank quality, ¼-inch thick, per 100 lbs., f. o. b. Pittsburgh:
6¼ to 100 inches wide $1.25 $1.30

Extras over base price—

3/16-inch thick	.10
Gauges 7 and 8	.15
Gauge 9	.25
Gauges 10 and 11	.25
Circles	.20
Sketches	.10
Boiler and flange quality	.10
Marine steel	.40
Widths over 100, to 110 in.	.05
Widths over 110, to 115 in.	.10
Widths over 115, to 120 in.	.15
Widths over 120, to 125 in.	.25
Widths over 125, to 130 in.	.50
Widths over 130 in.	1.00

IRON AND STEEL SCRAP.

Old steel rails, re-rolling	$12.50	$13.00
Old steel rails, re-melting	12.50	13.00
Steel axles	16.00	16.50
Heavy melting scrap	12.75	13.00
Low phosphorus	15.00	15.50
Sheet scrap	10.75	11.00
No. 1 wrought scrap	12.50	13.00
Machine shop turnings	9.25	9.75
Cast borings	9.00	9.50
No. 1 cast	12.25	12.50
Old car wheels	12.75	13.00
Old iron rails	14.75	15.25
Railway Malleable	12.00	12.25
Iron car axles	21.00	22.00

TIN AND TERNE PLATES.

Open market, f. o. b., Pittsburgh—
Coke tins:

14x20, 100 lbs.	$3.40
14x20, 95 lbs.	3.35
14x20, 90 lbs.	3.35
Charcoal tins:	
A grade, 14x20, I. C.	4.40
A grade, 14x20, 100 lbs.	4.25
Ternes:	
20x28, I. C.	6.60
20x28, 200 lbs.	6.30

STEEL RAILS.

Fifty pounds and heavier
500 tons or less, net $28.00
Car load lots 30.00
Less than car load lots 32.00
Light rails:
12 pounds 26.00
16, 20 and 25 pounds 25.00
30 and 35 pounds 25.00
40 and 45 pounds 25.00
Relaying rails—
Subject to inspection, f. o. b., Pittsburgh:

Standard 50 lbs. & heavier	$22.00	$23.00
25 to 40 lbs.	22.00	22.50
16 to 20-pound rails	22.00	22.50

STEEL SHEETS.

Open market, per 100 lbs., f. o. b. Pittsburgh—

Gauge.	Black	Galv.
30	$2.05	$3.25
29	1.95	3.00
28	1.90	2.90
27	1.85	2.75
25–26	1.80	2.60
22–24	1.75	2.40
17–21	1.70	2.30
15–16	1.65	1.95
13–14	1.60	1.95
Blue Annealed.		
10 and heavier	$1.40	$1.45
11–12	1.45	1.50
13–14	1.50	1.55
15–16	1.60	1.65

Corrugated Roofing.
Per square, 28 gauge, f. o. b., Pittsburgh—

Painted	$1.35	
Galvanized	2.50	$2.55

WIRE AND NAILS.

Prices to jobbers in car load lots, per 100 lbs.; retailers 5 cents additional :

Wire nails	$1.50@1.60
Plain wire	1.30@1.45
Painted barbed wire	1.55@1.70
Galvanized wire	1.80@2.00

ALUMINUM PRICES.

No. 1 ingots, guaranteed over 99 per cent pure are held at 24c per pound in ton lots.
For small lots of 100 pounds and over advances of 3c per pound are charged.
Rods and wire .....base price 31 cents
Sheets .....base price 33 cents

BITUMINOUS COAL PRICES.

Pittsburgh district, f. o. b. mine—

	Per Ton
Mine-run	$1.15@1.25
¾-inch	1.25@1.35
1¼-inch lump	1.35@1.45
Slack	.65@ .75

	Ohio	
At Cleveland—	Pgh.	No 8
Mine-run	$2.13	$1.95
¾-inch	2.23	2.05
1¼-inch lump	2.33	2.15
Slack	1.63	1.40

		Free-
At Buffalo—	Pgh.	port.
Mine-run	$2.40	$2.10
¾-inch	2.50	2.20
1¼-inch lump	2.60	2.30
Slack	1.90	1.60

	Ohio	
At Detroit—	Pgh.	No. 8
Mine-run	$2.55	$2.25
¾-inch	2.65	2.35
1¼-inch nut	2.75	2.45
Slack	2.05	1.60

	Ohio	
At Chicago—	Pgh.	No. 8
Mine-run	$3.05	$2.75
¾-inch	3.15	2.85
1¼-inch nut	3.25	2.95
Slack	2.55	2.25

MERCHANT PIPE.

Base discounts, car load lots, subject to the usual variation of 5 per cent:

	Black Butt.	Black Lap.	Galvanized Butt.	Galvanized Lap.
⅛, ¼ inch	73	..	53	..
⅜ inch	74	..	64	..
½ inch	77	..	67	..
¾ to 1½ inch	78	..	72	..
2 inch	81	77	74	70
2½ to 3 inch	81	79	74	72
4½ to 6 inch	..	78	..	70
7 to 12 inch	..	76	..	66
Extra strong plain ends—				
⅛ to ⅜ inch	70	..	60	..
½ inch	75	..	69	..
¾ to 1½ inch	79	..	73	..
2 inch	80	76	74	70
2½ to 4 inches	..	78	..	72
4½ to 6 inches	..	77	..	71
7 to 8 inches	..	70	..	60
9 to 12 inches	..	65	..	55

The above steel pipe discounts are for "card weight." Less than carloads to destinations east of the Mississippi, two points lower.

WROUGHT IRON PIPE.

Full weight genuine wrought iron pipe car load prices to consumers; prices to jobbers one point and 5 per cent.

	Butt. Black	Butt. Galv.	Lap. Black	Lap. Galv.
⅛, ¼ inch	68	48	..	..
⅜ inch	68	58	..	..
½ inch	71	61	..	..
¾ to 1½	75	67	..	..
2 and 2½ inch	76	69	..	..
2 inch	..	..	71	63
2½ to 4 inch	..	..	74	67
4½ to 6 inch	..	..	73	65
7 to 12 inch	..	..	71	61
Extra Strong Plain Ends.				
⅛, ¼, ⅜ inch	65	55	..	..
½ inch	70	64	..	..
¾ to 1½ inch	74	68	..	..
2 and 2½ inch	75	69	..	..
2 inch	..	..	71	65
2½ to 4 inch	..	..	73	67
4½ to 6 inch	..	..	72	66
7 to 8 inch	..	..	65	55
9 to 12 inch	..	..	60	50
Double Extra Strong Plain Ends.				
½ inch	60	54	..	..
¾ to 1½ inch	63	57	..	..
2 and 2½ inch	65	59	..	..
2 inch	..	..	61	55
2½ to 4 inch	..	..	63	57
4½ to to 6 inch	..	..	62	56
7 and 8 inch	..	..	55	45

MERCHANT STEEL.

Cold rolled and ground shafting, 55 per cent off, car load lots; 50 per cent off less than car load lots; delivered in base territory:

Planished tire steel	$1.30@1.40
Iron finish, up to 1½x½ in.	1.35@1.45
Iron finish, 1½x½ in. and over	1.20@1.30
Toe calk steel	1.70@1.80
Railway spring steel	1.70@1.80
Cutter shoe	1.95@2.05
Flat sleigh shoe	1.55@1.65
Crucible tool steel	7.00@8.00
Open hearth spring steel	2.05@2.30

Freight Rates on Pig Iron, Finished Steel, Coal and Coke

PIG IRON.

Pig iron, from Virginia furnaces to	Pgh.	Cin.	St. L.	Chi.	Phil.	N. Y.	Bos.
Shenandoah	$2.50	$2.35	$3.60	$3.20	$2.35	$3.30	$3.35
Bristol	4.35		3.75	4.10	3.60	4.55	4.60
Buena Vista and Roanoke	2.90	2.35	3.60	3.20	3.00	3.95	4.00
Kayula, Ivanhoe, Rural Retreat	2.90	2.35	3.60	3.20	3.40	4.35	4.40
Pulaski, E. Radford, Max Meadows.	2.90	2.35	3.60	3.20	3.25	4.20	4.25

Pig iron from Birmingham, Ala., tons of 2,240 lbs., to—	
Boston, by water	$4.60
Chicago	4.35
Cincinnati and Ohio river	3.25
Cleveland	4.35
Milwaukee and Northwest	4.75
New York, all rail	5.95
New York, rail and water	4.25
Philadelphia, all rail	5.00
Philadelphia, rail and water	4.00
Pittsburgh	4.90
St. Louis	3.75
To Pittsburgh from—	
Dunbar furnaces	.85
Kittanning furnaces	.60
Scottdale furnaces	.85
Valley furnaces	.90
Wheeling	.90
Valley furnaces to—	
Cleveland	.90

PIG IRON AND BILLETS.

Pittsburgh to	Pig iron.	Billets.
Baltimore	$2.15	$2.30
Buffalo	1.75	1.80
Boston	2.85	3.00
Chicago	2.80	3.00
Cincinnati	2.20	2.40
Cleveland	1.40	1.50
Columbus	1.60	1.90
Dayton	1.85	2.20
Detroit	2.15	2.25
Erie, Pa.	1.40	1.50
Indianapolis	2.20	2.65
Louisville, Ky.	2.80	3.00
New York	2.45	2.60
Philadelphia	2.25	2.40
Portsmouth, O.	2.10	2.50
Rochester	1.80	1.90
Richmond, Va.	2.65	2.80
Syracuse	2.10	2.20
St. Louis	3.50	3.80
Steubenville	.80	.90
Toledo	1.75	1.95
Wheeling, W. Va.	.90	1.00
Youngstown	.90	1.00
To Pittsburgh from—		
Mahoning and Shenango valleys	1.00	
Wheeling	1.00	

COKE.

From Connellsville region, per 2,000 pounds, to—

	Fur.	Fdry.
Buffalo	$1.65	$1.90
Baltimore		2.15
Cleveland		1.65
Columbus		1.65
Cincinnati		2.10
Chicago		2.50
East St. Louis		2.80
Hamilton, Ont.		2.20
Joliet		2.65
Louisville		2.65
New York		2.85
Pittsburgh	.75	.80
Philadelphia		2.15
Richmond, Va.		2.95
Toledo	1.95	2.25
Valley furnaces	1.35	
Milwaukee	2.55	2.75
Detroit	2.10	2.25

TIN PLATE.

Per 100 lbs., Pittsburgh to—	C.L.	L.C.L.
Boston, Mass	18	21
Albany, N. Y.	16	19
Baltimore, Md.	14½	17½
Birmingham, Ala.	41	68
Cleveland, O.	10	13
Columbus, O.	12	15
Cincinnati, O.	15	18
Concord, N. H.	18	21
Charlotte, N. C.	39	61
Charleston, S. C.	33	70
Charleston, rail and water.	23½	31
Covington, Ky.	15	18
Chattanooga, Tenn.	33	65
Chicago, Ill.	18	21
Canadaigua, N. Y.	13½	16
Des Moines, Ia.	37½	48½
Detroit, Mich.	15	18
Denver, Colo.	84	1.18
Dover, Del.	17	20
Buffalo, N. Y.	11	13
East St. Louis	22½	26
Hartford, Conn.	18	21
Indianapolis, Ind.	17	19½
Louisville, Ky.	18	21
Montpelier, Vt.	21	24
Minneapolis, Minn.	32	42
New York	16	19
Norfolk, Va.	20	24
Natchez, Miss.	32	61
Portland, Me.	18	21
Providence, R. I.	18	21
Philadelphia, Pa.	15	18
Richmond, Va.	20	24
Rochester, N. Y.	11½	13½
Syracuse, N. Y.	13½	16
St. Louis, Mo.	22½	26
Terre Haute, Ind.	18	21
Topeka, Kan.	54½	68
Trenton, N. J.	16	19

FINISHED PRODUCTS.

Finished steel products, including plates, structural shapes, merchant steel and iron bars, skelp, pipe, fittings, hoop and cotton ties, plain and galvanized wire nails, rivets, spikes and bolts (in kegs), black plates, except planished, chain, etc., per 100 lbs.:

Pittsburgh to—	
Albany	.16
Buffalo	.11
Boston	.18
Baltimore	.14½
Canadaigua	.13½
Cleveland	.10
Columbus	.13
Cincinnati	.15
Chicago	.18
Harrisburg	.14½
Louisville	.18
New York	.16
Norfolk	.20
Philadelphia	.15
Rochester	.11½
Richmond	.20
Scranton	.15
St. Louis	.23
Washington	.14½
To Pittsburgh from—	
Mahoning and Shenango valleys	.05
Wheeling	.05

COAL.

Coal rates from mines—		
To Ashtabula	$1.00	
To Allegheny, Pan Handle Ft. Wayne tracks	.43	
To Allegheny, West Penn tracks	.48	
To Allegheny, B. & O.	.35	
To Pittsburgh, P. R. R. Main Line.	.40	
To Pittsburgh, B. & A. V. Div.	.48	
To Pittsburgh, B. & O.	.33	
To Valleys	.70	
To Buffalo	1.25	
To Cleveland	1.00	
To Detroit	1.40	
To Chicago	1.90	
To New York, gross ton	2.25	
To Philadelphia, gross ton	2.00	
From Freeport—		
To Buffalo	1.10	
For Lake shipments—	Cargo.	Fuel.
To Ashtabula	.88	.98
To Cleveland	.88	.98
To Erie	.88	.98
West Virginia rates from mines—		
To Chicago	1.90	
To seaboard points, gross ton	1.80	
From No. 8, of Ohio—		
To Cleveland	.98	
To Chicago	1.65	
To Detroit	1.15	

New Construction and Extensions

Iron and Steel.

Youngstown, O. — Hohlock-Beiling Company of this city has been awarded a contract by the Ohio Steel & Wire Company, Warren, for the erection of its plant. The building will be of steel, concrete and brick construction, fireproof throughout. All purchases of machinery have been made and the plant will be in operation in May or June.

Detroit, Mich.—L. V. McKesson and George B. Storer, Toledo, have purchased from Foster W. Jewell the controlling interest in the Standard Steel Tube Company, with a plant at Detroit and Fitchland avenues. L. V. McKesson was chosen president, and George B. Storer was made vice president, treasurer and manager. R. F. Wieland was re-elected secretary of the company, Mr. Jewell retiring. Plant will be enlarged.

Steelton, Pa. — Pennsylvania Steel Company has broken ground for extensions to open hearth department and erecting shops. Storehouse, blacksmith and carpenter shop are being built, concrete and corrugated iron. Buildings 50x150 and 50x75. Company's erecting department is doing the work.

Atlanta, Ga.—Altanta Steel Company, plans erection of additional open-hearth furnace and important improvements.

Canton, O. — Lloyd Young was awarded the contract for erecting a one-story frame and steel factory addition, for the American Mine Door Company, to cost $6,000.

Massillon, O. — Work will soon be started on erecting a one-story brick, corrugated iron and steel factory addition, on Columbus Heights, for the Massillon Rolling Mill Company. Cost $10,000.

Auto, Auto Accessory.

Pittsburgh—Reported that Krupp Motor works, new automobile concern, has obtained option on site near Ambridge, Pa., for new plant to cost $75,000. H. F. Woodburn, representing the company, has optioned the site. Company now has small plant for motors in Cleveland district, but is planning to go into motor car manufacture.

Wheeling, W. Va. — New company to manufacture tires, headed by Mr. Paul, of Pittsburgh, has secured plant of old steel ceiling company at North Warwood (Glennova, W. Va.), and will remodel for manufacturing purposes. Machinery purchased. Company will be capitalized at $100,000.

Bridge and Structural.

Dayton, O.—Contract was awarded by the Service Department for construction of a canal bridge on Sperling avenue, to A. L. S. Fox at his bid of $1,707.

Pittsburgh.—Pittsburgh Bridge & Iron works, Pittsburgh, will furnish structural steel and Columbian Concrete Steel Bar Company, Union Bank building, Pittsburgh, the reinforced concrete work for White Motor Car sales building, Craig street, Pittsburgh; S. Y. Feltyberger, general contractor.

Fairmont, W. Va.—McClintic-Marshall Construction Company, Pittsburgh, will furnish structural steel for warehouse, 180x350, for Owens Bottle Machine Company.

Pittsburgh — Structural contract for Carnegie Tech schools addition, was awarded Fort Pitt Bridge Works, Pittsburgh.

Massillon, O.—The Board of County Commissioners awarded to the Massillon Bridge & Structural Company the contract for constructing a steel bridge, 44 feet long, 13 feet wide, on West Main street and Ohio & Erie canal.

Pittsburgh.—Independent Bridge Company received contract $55,000 manufacturing plant, Pittsburgh. Owner, T. J. Keenan, Pittsburgh.

Coal Mining; Coke.

Morgantown, W. Va.—Consolidation Coal Company of Fairmont has made the location for a shaft on the O. J. Eddy farm.

Harrisburg. — Application has been made for charter for Big Sandy Coal Company, Bellefonte, Pa., capital $25,000; to mine coal in Center county.

Columbus, O. — Ohio charters will be taken out shortly for the Lake Erie & Ohio River Railroad, with capital of $8,000,000, and the International Mining & Manufacturing Company, with capital of $25,000,000. Projectors of the new companies plan to build a railroad from Sandusky to the Ohio river by way of Lancaster, Allensville, Mamden and Wellston, erect cement works and open coal mines.

Morgantown, W. Va. — Consolidation Coal Company, of Fairmont, has made the location for a shaft on the O. J. Eddy farm, about six miles up Indian Creek, in the Arnettville district. Company proposes building a spur from the Buckhannon to Northern Railroad to the new mine. The Eddy farm is a part of the Milholland tract of coal land, aggregating 12,000 acres, several years ago taken over by the Consolidation Company. The location of the shaft on the Eddy farm probably means that the Consolidation company plans the immediate development of its Monongalia coal lands.

Boilers, Power Plants, Etc.

Cincinnati.—Contractor Frank Kirchner secured American Toilet & Supply Company property, 16-20 West Court street and will build power building. Architect not yet selected.

Elyria, O.—Cleveland Southwestern & Columbus Traction system will expend $100,000 on power house improvements here, including new boilers, turbines and motors. Company plans to sell power at Bucyrus, Shelby, Mansfield and Grafton, O.

Cincinnati, O. — Cincinnati Traction Company will in a few days complete installation of new turbine generator in the Pendleton power plant in the East End, the third generator of that type. The machine is rated 6,000 kilowatt. Pendleton plant will supply all the eastern half of the city, and allow the abandonment of the Hunt street station Eventually the Cumminsville station will also be closed, and all power developed in the Pendleton and the Depot street plants.

Power, Hydro-Electric.

Norfolk, Va.—Virginia Railway & Power Company has acquired property for power plant, car barns and shops to cost when complete and fitted $200,000. Architects Neft & Thompson, of Norfolk, have drawn tentative plans. Two fireproof barns to be used for the accommodation of all traction equipment on the Norfolk side of the river, and large enough to house the traction equipment of the company of every description are included in plans. President, William Northrop; general manager, C. B. Buchanan.

Belleville, Ill. — Hamilton Water Company, of Marissa, Ill., was incorporated under an Illinois charter. The incorporators are: J. A. Hamilton, of Marissa and William M. Hoppe and Henry J. Fink, of Belleville; capital stock $6,000. The new corporation contemplates construction of a waterworks' system for Marissa, a town on the Illinois Central, southeast of Belleville, and will ask a franchise from the village council.

Harrisburg, Pa. — Papers have been filed at the State Department announcing the merger of the Citizens' Water & Gas Company, and the Williamsport

Water Company, under the latter's name. The capital of the new corporation is $1,010,000.

Warehouses, Business Bldgs.

Cleveland, O.—Architects Knox & Elliott, Rockefeller building, are drawing preliminary plans for a brick and stone labor hall building for the Brotherhood of Locomotive Firemen and Engineers. The building is to cost $400,000.

St. Louis—General Paper Stock Company will build new warehouse and plant on a site at Second and Rutger streets. F. R. Peters, president. Plans contemplate five stories and basement to cost from $125,000 to $140,000. Fireproof and slow combustion, with sprinklers. Company has warehouses at Sixth and O'Fallon streets and Eighth street and Cass avenue.

Cleveland, O. — Architect G. A. Tenbush, 201 Tenbush building, has plans in progress for a five-story brick and reinforced concrete light manufacturing building, to be constructed on Prospect avenue, for the Tenbush Realty Company. Cost $90,000.

Toledo, O. — Architects Ed Thal & Company, 1050 Ohio building, awarded to F. R. Stahl, Builders Exchange, the contract for erecting a three-story brick factory addition, for Hetterick Brothers Company, Hoag street. Cost $4,000.

Cincinnati.—Thompson-Sterrett Company, New York, was awarded contract for Union Central Life building, on site of Cincinnati Chamber of Commerce. Building to be 19 stories. Contract in neighborhood of $2,000,000. Jesse R. Clarke, president Union Central Life Insurance Company, Cincinnati.

Hardware, Sheet Metal, Etc.

Pittsburgh. — Architect William G. Wilkins Company have plans nearly completed for a six-story brick, terra cotta, steel and concrete warehouse, at Reliance street and Rose alley, Northside, for Frick & Lindsay Company. It will cost $90,000.

Cleveland, O. — Cleveland-Copman Electric Stove Company has been incorporated here with capital of $10,000. J. B. Roof heads the list of incorporators.

Cincinnati, O. — Cincinnati & Hammond Spring Company was incorporated as an Ohio corporation, with $50,000 capital. The company has been a New Jersey corporation, with a capital of $200,000, and operated two vehicle spring plants, one here and the other in Hammond, Ind. The plant at Hammond has been sold, and all business will be concentrated at the local plant. E. V. Verman is president of the company.

Public Works.

Xenia, O.—Levi Riddell, engineer, is drawing plans for city of Xenia for a sewage disposal plant, to cost $40,000.

Hubbard, O.—Town authorities have accepted plans prepared by Engineer William Wilson, Wick avenue, Youngstown, for municipal water system.

Salem, O.—Board of Public Service and Engineer L. E. Chapin, Frick building, Pittsburgh, will take bids till January 26 for erection of sewage disposal plant, to cost $50,000.

Somerset, Pa.—Borough Council will submit to State Board of Health for approval plans by Engineer Frank Flunk for municipal sewage disposal plant.

Etna, Pa. (Allegheny county)—Borough voted to issue $25,000 bonds for improvement of city water works system.

Wheeling, W. Va.—Board of Control is considering estimates submitted by J. L. Smith for the installation of a filtration plant. Mr. Smith installed plant at Parkersburg, W. Va., recently.

Wheeling, W. Va.—Bids will be opened at the local United States engineer's office in the federal building on January 24 for furnishing and delivery of two dump scows, which will be used during the construction of dam No. 26, which is located near Huntington, this State. Efforts will be made to have this dam completed before the end of the present year.

Cleveland, O.—Mayor Baker opened negotiations on January 11 for the purchase of the Cleveland Electric Illuminating Company by the city. He wrote a letter to Samuel Scovill, active head of the concern, practically giving the company the choice between sale to the people at actual physical value, or municipal competition. Plans of the company call for an expenditure of $2,783,878.77 in enlarging the plant and equipment. City voted at last election in favor of $2,000,000 bond issue for a municipal lighting plant.

Washington.—Proposals will be received January 26, by Isthmian Canal Commission, for wrought iron or steel pipe, pipe fittings, stovepipe, brass tubing, copper ferrules, valves, hose nozzles, hose couplings, grease cups, horseshoes, steel or iron wire, files, wrench parts, packing, gaskets, fire brick, steel tapes, etc. (Circular 674).

Cincinnati, O.—Architects Garber & Woodward, Andrews building, are about ready for estimates on constructing a brick school building on East Clifton avenue and Main street for the Board of Education. Cost $200,000.

Columbus, O.—D. W. McGrath, New First National Bank building, received the contract for construction of a two-story brick fireproof museum and library building on the University Campus for the Ohio State Archaeological Historical Society.

Cincinnati.—Roof repairs and other improvements planned for California pumping station, city water works.

Dayton, O. — Architect Edward J. Moundstephen, McIntyre building, has plans nearly completed for a four-story brick fireproof Manual Training School addition to be constructed on East Sixth street for the Board of Education. Cost $125,000.

Dayton, O.—The United States government awarded to Charles McCaul, Tenth and Sampson streets, Philadelphia, the contract for constructing a three-story stone fireproof post office and government building on Third and Wilkinson streets. Cost $680,000.

Railroad Structures.

Chicago—Rock Island has sold $20,000,000 of debenture bonds to defray cost of terminals and a bridge across the Mississippi at Memphis, Tenn., and terminal improvements at Omaha.

Parkersburg, W. Va.—Plans for proposed new terminal freight depot which the B. & O. is to erect in this city have been completed by Chief Engineer F. L. Stewart, of Baltimore.

Toledo, O.—New reinforced concrete coal docks and repair shops will replace the buildings of the Hocking Valley railroad at Walbridge, O., burned recently. General Manager M. S. Connors, Toledo, is in charge of the improvement.

Philadelphia. — Pennsylvania Railroad is having plans prepared for a concrete pier, 150 by 600 feet, which will be erected at Christian street wharf, Delaware river.

Wheeling, W. Va.—Work will begin February 1, by Wheeling Traction Company, on erection of barn in North Warwood; expected that the structure will be completed in forty working days.

Sharpsburg, Pa. — Foundations have been started for a one-story brick freight station, to be erected for the Baltimore & Ohio Railroad Company, by Contractors George Hogg Company, 804 Penn avenue, Pittsburgh.

Machinery and Tool.

St. Louis. — Busch-Sulzer Brothers-Diesel Engine Company, has bought site, 8⅔ acres, at Second and Utah streets, for proposed new plant. Buildings and equipment to cost $500,000. Company capitalized in Missouri at $2,100,000. Adolphus Busch, St. Louis, heads company, associated with Robert Sulzer, one of the original manufacturers of the

Diesel engine, and Rudolph Diesel, of Munich, Germany, inventor. Company's offices at 2923 South Broadway, St. Louis. Ground broken for buildings.

Chicago, Ill.—Baldwin Locomotive Company has plans under way for new plant at Calumet, Ill., for which 370-acre site has been secured. Plans not yet ready for bidding.

Wheeling, W. Va.—American Propeller Company, Washington, D. C., advertises in Wheeling papers for small woodworking plant, 2,000 to 5,000 square feet, with machinery, near Wheeling or Parkersburg. Company will purchase equipment and rent premises.

Foundry and Machine.

Newark, N. J.—Raymond Concrete Pile Company awarded contract for piles and reinforced concrete foundations for addition to the foundry buildings of Titan Steel Casting Company, foot of Chapel street, Newark. Charles W. Guttzeit, general manager.

Pipe, Pipe Fittings.

Grafton, W. Va.—Council awarded 1,280 tons straight pipe and 12 tons special castings to United States Cast Iron Pipe & Foundry Company at $21.70 for 12- and 14-inch cast iron pipe and $50 for castings; whole amount of successful bid $28,376. There were six bidders. Extensions to water system are projected. F. D. Barber, city engineer.

Concrete, Brick, Clay.

DuBois, Pa. — L. A. Fischel, general manager Bohemian Art Pottery Company, states that the company has been investigating the clays in this locality, and that it has located three kinds of clay which have proven satisfactory. It is the purpose of the company to establish a plant soon for the manufacture of ornamental pottery.

Miscellaneous.

Toledo, O.—Urschel-Bates Company, Dorr street, Toledo, decided to erect plant at Welland, Ont., for manufacture of paper bags. L. M. Bates, president; L. H. Hartman, secretary and manager.

Moundsville, W. Va.—Stockholders of Fostoria Glass Company, at their annual meeting, will act on a resolution to increase the capital stock to $1,000,000, a part of the stock to go on themarket. The matter of erecting a new 14-pot furnace will be taken up.

Scranton, Pa.—Buffalo capitalists, owners of the fertilizing plant at Moosic that was destroyed by fire several months ago, have announced that the plant will be rebuilt at once at a cost of about $50,000. At the time of the fire the property was leased to the Coe-Mortimer Company of New York. The third year of a five-year lease had run out, and the New York concern did not intend to rebuild.

St. Louis.—A new reconverting plant and an entire new factory, were decided on at the annual meeting of the stockholders of the Hagen Paper Company, 113 South Eighth street. H. Hagen, Jr., president; E. C. Gerlach, secretary and treasurer. Work on the building will be started as soon as a site can be chosen.

Cincinnati, O.—Mendel & Company, trunk manufacturers, Pearl street, are negotiating for a factory site at Oakley; expect to spend about $50,000 in a suburban plant.

Cincinnati, O.—Architects Bert Baldwin & Company have been retained by the M. Werk Company, soap manufacturers, to make plans for new plant at St. Bernard, the improvement to cost about $300,000. None of the details for layout of the factory has been decided upon. Company recently acquired 20-acre tract which has been graded and switching rights secured.

East Liverpool, O.—East Liverpool City Ice Company, capitalized at $80,000, J. Willis Gaston and others incorporators, has plans prepared for ice plant to cost $60,000. Company already operates two plants in this city and Wellsville, O. New building will be 46x100, 3-story. Contracts not placed.

Philadelphia. — Penckert & Wonder are preparing plans for a four-story concrete factory, 66 by 90 feet, at Randolph and Race streets, for Burk Brothers. The cost will be $30,000.

Columbia, S. C. — Brecht Company, of Cincinnati, was awarded contract to build the Columbia abattoir and equip it, at bid of $15,000.

Cincinnati, O. — The J. Hauck Brew-

Wanted, For Sale, Bargains.

Want and For Sale advertisements published in these columns, one cent a word. No advertisement taken less than 25 cents.

WANTED

WANTED— 1 yard crane, about 75-foot span, 220 volt, 10-ton lift, with about 300 feet of runway. Address Industrial World, Box 10-A, 108 Smithfield St., Pittsburgh, Pa.

WANTED—New or second-hand equipment as follows:
One 12" or 14" engine lathe, with 12-foot bed, for automobile work and general use.
One 16" or 18" engine lathe, for heavy work, to take automobile axles.
One 20" upright drill complete.
One radial drill, for use on frame work, largest hole to be bored, estimated at 1¼".
One 25 H. P. twin cylinder gas engine.
One 25 kw. generator.
One electric drill (hand work).
One 16" or 18" lathe, 8-foot bed, to take about 5 feet between centers. Combination rest; power cross feed; back geared and hollow spindle.
One 22" or 24" drill press.
One 20" drill press, both hand and power feed.
One 24"x36" slide valve engine (left hand).
One 20"x36" Corliss engine (left hand).
One 600 H. P. Corcoran water heater (open type).
Address H, care Industrial World, Pittsburgh, Pa.

WANTED — Inquiries to purchase or sell iron, steel, metals, machinery, contractors' equipment, iron buildings, and bridges. Address Thomas J. Pope, 39 Beekman street, New York.

POSITIONS WANTED

WANTED—Clean-cut Young Man, 24 years old, of good habits, appearance and address, exceptional ability and ambition, desires to connect with a first-class concern as an all-around man, for either inside or outside work. Opportunity desired more than salary at present. Has technical and clerical experience as a draftsman and estimator, also spent some time in sales department as correspondence clerk and sales duties, with reputable concerns; excellent references. Address B, care Industrial World, Pittsburgh, Pa.

Want and For Sale advertisements published in these columns, one cent a word. No advertisement taken less than 25 cents.

ASSISTANTS WANTED

WANTED—Assistant Purchasing Agent who has had experience in the iron and steel business. State experience, where last employed and salary expected. Address Box C,, care Industrial World, Pittsburgh, Pa.

WANTED—Assistant Superintendent of Machine Department. One who has had experience in the building of engines and rolling mill machinery. State eperience, where last employed and salary expected. Address Box D., care Industrial World, Pittsburgh, Pa.

WANTED — Salesman for Cement Coated Wire Nails. Must have had experience. Give reference, name and salary. All communications strictly confidential. American Steel Company, Park Building, Pittsburgh, Pa.

FOR SALE

FOR SALE—240 acres of pink dolomite limestone, along the Baltimore & Ohio Railroad. For further information, call or write to G. W. Engle, Charles-Town, Jefferson county, W. Va.

FOR SALE—The drawings and patterns of a line of metal working machinery, sufficient to equip completely, Steel Plants, Rolling Mills, Tube Mills, Spring Works, Bridge Works, Boiler Shops, and Plate-Glass Plants The engineering and selling talent also is available. Address Engineer, care the Industrial World, 108 Smithfield street, Pittsburgh, Pa.

HYDRAULIC WHEEL PRESSES
29 Sizes. Capacities 50 to 400 tons
AIR COOLED AIR COMPRESSORS
6 Sizes. Capacities 4 cubic feet to 25 cubic feet.
Write for catalogues and prices.

ing Company, 433 Dayton street, will be ready for estimates about January 15, on erecting a five-story brick, steel and reinforced concrete stock house.

Cleveland, O. — Architect Charles S. Pennington, 14707 Lake avenue, Lakewood, will take bids on erecting a one-story brick ice storage addition, on 2038 West Fifty-fifth street, for the Lake City Ice Company. Cost $4,000.

Erie, Pa. — Architects J. W. Yard & Son, 806 State street, have completed plans for two-story brick and stucco shops, to be erected on Twelfth and Sassafras streets, for W. H. Whitehead, 24-25 Park Place, Evanston, Ill. Cost $6,000.

Fairmont, W. Va.—Foundations are in for a brick, steel and reinforced concrete repair shop and factory building, to be erected for the Monongah Glass

MANUFACTURING PURPOSES

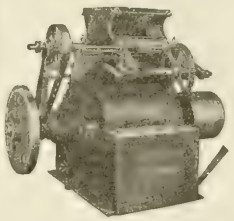
The Sweeney Industrial Properties are located in the heart of the Niagara frontier, on the city of North Tonowanda) 20 minutes' run from Buffalo and Niagara Falls. We are at the foot of Lake navigation, and at the point where the 1000-ton barge canal enters into the Niagara river, thus giving us water communication with New York City and the East, and Chicago and the West. We have some 20 different railroad connections. Niagara Falls Electric power, natural gas, and are an up-to-date city of 25,000 people, and in close touch with Buffalo and other places, from which to draw labor. Floor space and manufacturing plants for rent. Will build for desirable tenants on long-time lease. New cement block factory, 70x300. All improvements. Railroad siding, two blocks from freight and express. Offices for rent from May 1, next. We solicit correspondence from manufacturers who are located in close, cramped quarters in cities, and ask them to look over our proposition, with a view of locating where conditions are very attractive. Write

JAMES SWEENEY, JR.,
Agent Sweeney Industrial Properties,
North Tonawanda, N. Y.

THE
Smith Gas Power Company
LEXINGTON, :: OHIO
Builders of the
SMITH
AUTOMATIC GAS PRODUCER
(Suction and Pressure Type)

Mechanically operated gas producers in large units Suitable for Power and Fuel Gas Plants.

TAR EXTRACTORS
AND GAS CLEANING PLANTS



Jeffrey 36"x24" Pulverizer —Capacity 12 tons Limestone per hour, 75% will pass 80 mesh.

JEFFREY PULVERIZERS

for the reduction of Cement, Limesone, Fertilizers, etc., have larger capacities, yield more uniformly fine product and cost less per ton output than any other pulverizer on the market.

Write for Catalog 31, Jeffrey Crushers and Pulverizers.

Manufacturers of Elevating, Conveying and Power Transmission Machinery, Screens, Crushers, etc.

JEFFREY MFG. COMPANY,
COLUMBUS, OHIO. (1-22-12)

"A. B." Flaming Arc Lamps

The most efficient mill lighting.

Electrical Supplies.
DOUBLEDAY-HILL ELECTRIC CO.
919 LIBERTY AVENUE
PITTSBURGH, PA.

Electrical Equipment of Every Description

LOWEST PRICES—QUALITY CONSIDERED

Ask the Expert

¶ If you are having trouble with your power plant and find your power is costing more than it should, Call 3200 Grant, Contract Department, and have one of our power expert help you solve the problem. His services and advice will cost you nothing.

The Allegheny County Light Co.

435 Sixth Avenue, Pittsburgh, Pa.

CUTLER-HAMMER

CRANE PANELS

Provide Every Protection for the Motors

No fuses are required and the expense and delay of renewing them is eliminated. Yet every necessary protection against overload, short circuit and failure of voltage is provided for.

This panel simplifies installation and groups all switches, protective devices, etc., in one location. Safety switches prevent accidents when inspection or repairs are made.

Cutler-Hammer Overloads, one of which is usually placed in each motor circuit, **can** be adjusted **without** the use of an ammeter.

On these panels two single-pole magnetic switches are used in the main line instead of a double-pole switch, because—

Should trouble cause a double-pole switch to stick, neither side of the line would be opened. But with two single-pole switches, as used on Cutler-Hammer Panels, there is practically no chance of sticking at the exact same time. Either one will open the circuit.

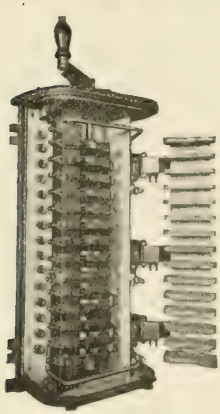
Also, if an overload remains on the line, one switch will trip and open the circuit as soon as the other closes. A double-pole switch will chatter or "telegraph."

Further particulars on request.

Crane Panel
for a three-motor crane

Drum Type Dynamic Brake

CRANE CONTROLLERS



Interior view

The Cutler-Hammer new Dynamic Brake Controllers are of the enclosed type. The tight fitting drum prevents dirt, dust, etc., from falling on the current carrying parts and prevents accidents to operator and machinery, which are so liable with open type controllers in small crane cabs.

The operator has absolute control of raising and lowering. Dependable service, without delays and injuries, increases the working capacity per day.

Dynamic brake controllers insure lowering the load under perfect control, even should the power fail. No mechanical lowering brake is required.

A description of these recently developed crane controllers is contained in a new bulletin. Our nearest office will send you a copy promptly. Drop us a post card to-day.

Casing closed

THE CUTLER-HAMMER MFG. CO. MILWAUKEE

NEW YORK: Hudson Terminal 30 Church Street CHICAGO: Peoples Gas Bldg. PITTSBURG: Farmers' Bank Building
BOSTON: 176 Federal Street PHILADELPHIA: 1301 Chestnut Street CLEVELAND: Schofield Building
PACIFIC COAST AGENTS: Otis & Squires, 579 Howard St., SAN FRANCISCO, 229 Sherlock Building, PORTLAND, ORE.
and W. S. Palmer, 416 E. 3rd St., LOS ANGELES.

Company, by Contractors Holbert & Spedden. Contract for brick masonry let to Swiger & Conoway. Cost $10,000.

Upper Sandusky, O. — Architects Wolf & Koehl, 715 Rose building, Cleveland, have plans in progress for a three-story brick, reinforced concrete and stone drug and food manufacturing plant, to be constructed for the Union National Drug Company. Cost $35,000.

Marysville, O. — The brick work is up to the second story on a two-story brick packing plant being erected for Robinson & Albright Packing Company, by Contractors Sharrer Brothers. Cost $12,000.

Charters to New Corporations.

Pennsylvania.

Graham P. Jackson & Company, Pittsburgh; $5,000; treating galvanized iron, galvanized iron scrap, tin plate, tin plate scrap, to buy iron and steel, etc. Graham P. Jackson, R. S. Wile, Albert McK. Jackson, all of Pittsburgh.

Freehold Lumber Company, Pittsburgh; $10,000; manufacturing lumber and builders' supplies, trading, dealing in timber, timber lands, logs, etc. Clifford S. McCleary, Chester A. McCleary, Robert E. Gannon, all of Pittsburgh.

Mercer Power Company, Mercer, Mercer county, Pa.; $5,000; supplying light heat and power. William F. Jaxtheimer, William R. Jaxtheimer, N. Wilson, all of borough of Greenville, Pa.

Pigeon Machine Company, Philadelphia; $75,000; manufacture machinery and parts from metal, wood or both. Albert M. Pigeon, 311 North Franklin street, Oscar W. Pigeon, 3537 North Eleventh street; Sheldon Potter, 48 West Tulpehocken street, all of Philadelphia.

Atlas Coal Company, Pittsburgh; $250,000; mining and marketing of coal and manufacture and sale of coke. George Z. Hosack, Carnegie, Pa.; James B. Haines, Glen Osborne, Pa.; James B. Haines III., Glen Osborne, Pa.; John A. Bell, Carnegie, Pa.; John A. Bell, Jr., Carnegie, Pa.

Kehoe & Mowery Company, Wilkes-Barre; $10,000; general contracting, building and mill work, etc. P. H. Kehoe, 114 Barney street; W. B. Mowery, 328 Carey avenue, both of Wilkes-Barre, Pa.; P. W. McKeown, 19 Oxford street, Hanover Township, Pa.

Pittston Black Diamond Powder Company, Pittston, Luzerne county; $250,000; manufacture and sale of high grade explosives, etc. Hugh W. Titman, Bloomsburg, Pa. Ellwood B. Brumm, Pittston, Pa.; Frank P. Slattery, Wilkes-Barre, Pa.

Generating Light & Motor Company, Philadelphia; $5,000; manufacturing isolated light, heat and power plants. Frank

FOR SALE

2—200 Horsepower Smith Gas Producers, with scrubbers and all connections.

1—400 Horsepower Horizontal Riverside Gas Engine, with all connections.

1—175 Horsepower Horizontal Riverside Gas Engine, with all connections.

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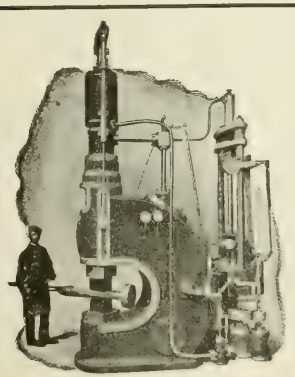
STEAM TURBINES
A. C. & D. C. GENERATORS
BLOWERS :: PUMPS
Southwark Foundry & Machine Co.
Philadelphia, Pa.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DOUBLE YOUR PRODUCTION WITH ONE HALF
YOUR LABOR COST AND STEAM CONSUMPTION.
COST OF REPAIRS REDUCED. ELIMINATES HEAVY SHOCKS AND VIBRATION.
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SMALL SIZES—SINGLE-FRAME TYPE. LARGE SIZES—FOUR-COLUMN TYPE.
BUILT FOR DOING ALL CLASSES OF FORGING, SHEARING OR PRESSING.
100 TONS TO 12000 TONS CAPACITY
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EXCLUSIVE MANUFACTURERS FOR UNITED STATES, CANADA AND MEXICO.

West 48th Market street; John L. Brady, 2-2 South Twentieth street, Joseph I. O'Leary, 445 North Thirty-second street, all of Philadelphia.

Big Sandy Coal Company, Bellefonte, Pa.; $25,000; mining, shipping of coal. W. D. Zerby, J. J. Bower, Ellis L. Orvis, all of Bellefonte, Pa.

Heppenstall Forge & Knife Company, Pittsburgh; indebtedness increased from nothing to $175,000. P. J. Halli, secretary.

Laural Cut Glass Company, Jermyn, Lackawanna county; capital increased from $60,000 to $200,000. A. G. Gebhardt, secretary.

Blairsville Enameled Ware Company, Blairsville, Indiana county; indebtedness increased from $43,000 to $90,000. H. L. Taylor, secretary.

Verona Steel Castings Company, Pittsburgh; capital increased from $10,000 to $750,000. William Bierman, secretary.

Mifflinburg Body & Gear Company, Mifflinburg, capital increased from $30,000 to $100,000. Warren R. Orwig, secretary.

W. R. Case & Sons Cutlery Company, Bradford, Pa.; capital increased from $60,000 to $250,000. H. E. Crandall, president.

Reed Dairy Supply Company, West Grove, Chester county, capital increased from $50,000 to $150,000. Charles E. Heald, secretary and treasurer.

Wadsworth Stone & Paving Company, Pittsburgh; capital increased from $200,000 to $360,000. J. A. Seidel, secretary

The Shohola Falls Hydro-Electric Company, Milford, Pike county, Pa., supply storage or transportation of water and water power for commercial and manufacturing purposes. Franklin J. Myers, Hillsdale, New Jorsey; Frank M. Eastman, Harrisburg, Pa.; W. V. Hilliard, Milford, Pike county, Pa.

Clearfield Bituminous Coal Corporation, principal office New York; indebtedness increased from $1,000,000 to $6,000000. W. C. Brown president

Western Electric Company Philadelphia, capital increased from $100,000 to $300,000. W. P. Sidley, President.

Chicklacla Moose Coal Company, Bellefonte county; $10,000; mining, shipping coal, etc. Ellis L. Orvis, J. J. Bower W. G. Zerby, all of Bellefonte, Pa.

Pottstown & Phoenixville Railway Company, office Philadelphia; indebtedness increased from nothing to $1,000,000. C. Taylor Leland, secretary.

Ardmore and Llanerch Street Railway Company Philadelphia; capital increased from $300 to $400,000. A. M. Taylor, President; H. H. Aikens, secretary.

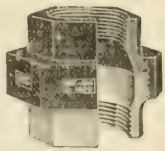
Shohola Falls Hydro-Electric Company, Milford, Pike county; $6,000. Frank M. Eastman, of Harrisburg, and others.

Valley Shoe Company, Elizabethville, Dauphin county; $20,000. S. A. Krause. Millersburg; A. M. Romberger, Christ Gaupp, Aaron Schwab and H. M. Miller, Millersburg.

Chinclacla Moose Coal Company, Bellefonte; $10,000

Missouri.

Western Millwork Company, St. Louis; $5,000. Casper J. Twiellenmeier, Theodore J. Twiellenmeier, Albert E. Haus-

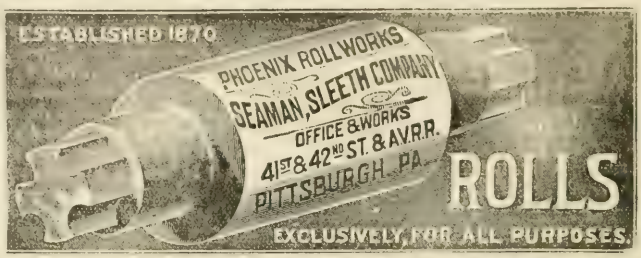


"The Union with no inserted parts"

IT WILL PAY YOU

to re-read that announcement about the special purpose of a union which appeared in last week's issue, page xvii.

National Tube Co., Pittsburgh, Pa.



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PITTSBURGH, PA.
Builders of Every Description of
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—FOR—
IRON AND STEEL WORKS.

Highest Grades Phosphor Bronze, Monel Metal and German Silver
IN RODS, SHEETS AND WIRE
Manufactured by SHIMER, McGLYNN & CO., Inc.
In their new and up-to-date mill. Correspondence solicited.
SHIMER & CO., Inc., Selling Agents, Bullitt Building, PHILADELPHIA, PA.
Pittsburgh Office: OLIVER BUILDING.

man. To manufacture and deal in woodwork, etc.

Concrete Roofing Tile Company, St. Louis; $5,000. B. N. Brown, W. M. Conway, P. E. Briscol.

La Plata Ice, Heat & Power Company of Kansas City; $25,000. G. A. Sickler, R. J. Lefite, H. J. Mairens.

Anchor Stove & Range Company of Indiana, home capital $100,000, licensed to employ $1,500 in business at Kansas City.

West Virginia.

Oxyactylene Company, of 54 Wall street, New York city, chief works in the State of Wisconsin; to manufacture and deal in oxygen, hydrogen and other gases, either separately or in conjunction with acetylene, etc.; mine, drill and deal in coal, oil, gas, wood lands, etc.; authorized capital $1,215,000, divided into 12,150 shares of $$100 each; $25,000 paid. E. J. H. Wright, of Oak Park, Ill.; George Hohman, 1949 Thorndale avenue; F. J. Ely, W. C. Pond and W. F. Barrett, of Chicago.

Howell-Chadock Printing & Decorating Company, Parkersburg, W. Va., to manufacture and sell paints, oils, varnishes, wall paper, etc.; $10,000, of which $5,000 has been paid. Harry L. Chaddock, Mary C. Chaddock, Clarence W. Howell, Bertha M. Howell and Joseph A. Galvin, all of Parkersburg.

West Virginia-Pittsburgh Coal Company, Charleston, to mine coal in Cross Creek district of Brooke county, and manufacture coke; $10,000. James S. McFadyen, Harvey N. Dauler, W. Murray Carr, Chester G. Fisher and J. Edward Farrell, all of Pittsburgh, Pa.

Gnatty Oil Company, Sutton, W. Va., to drill for oil and gas in Barbour and Upshur counties; $24,000. P. J. Newlon, E. W. Hefner and Nettie Newlon, Sutton; Orr Minear, Pennsboro; H. A. Harman, Bluefield.

Pittsburgh Saw Company, Pittsburgh, to manufacture and deal in saw machinery, etc.; $10,000. F. E. Markell, Connellsville, Pa.; G. I. Folsom, J. C. Swearer and John I. Heard, Pittsburgh; H. G. Young, of Charleston.

Royal Woolen Mills Company, Hagerstown, Md., to manufacture and sell men, women and children clothing; $10,000. W. E. Conner and G. C. Cecil, Parkersburg; John B. Sheets and K. C Sheets. Wheeling; H. A. McKinnie, Greenscastle, Pa.

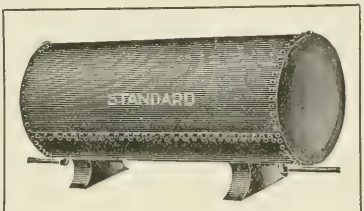
Billings Process Company, Birmingham, Ala., to manufacture and sell steel products and to deal in coal. James R. Offield, Albert H. Groves, Joyce M. Lutz, Samuel N. Pond, Frank L. Belknap, all of Chicago.

Marlington Service Company, Grafton, W. Va., to operate water and electric power plants, to construct cold storage houses; $30,000. John L. Hechmer, John T. McGraw, George A. Hechmer, of Grafton; John Alexander, Dwight Alexander, of Marlington.

Wenborne-Harpen Dryer Company, Chicago, to manufacture processes and devices for drying and treating varnishes; $50,000. Francis E. Mathews, Carey W. Rhodes, David S. Rosenthal, Leo S. Kostichek, Irving J. Solomon, all of Chicago.

(Additional Incorporations, Page 110.)

KNOX PRESSED and WELDED
. . . STEEL COMPANY . . .
MANUFACTURERS OF ALL CLASSES OF
STEEL PLATE CONSTRUCTION - WELDED STEEL SPECIALTIES
OFFICE: FARMERS BANK BUILDING, PITTSBURGH, PA. WORKS: NILES, OHIO.
Sole manufacturers of Knox Patented Water Cooled Parts, Doors and Door Frames for Open Hearth Furnaces.



Standard Tanks for any purpose: Water, Air, Oil, Gas. We guarantee every tank absolutely tight and all openings plugged for shipment, keeping the tank clean and the tappings free from injury.

We are manufacturers of all kind of Plate Construction, Stand Pipes, Self Supporting Stacks, Accumulators and Air Receivers; also Freezing Tanks and Drip Pans for ice plants.

Write for price lists on Pneumatic Steel Tanks, Air Receivers and Oil Storage Tanks, which we carry in stock ready for immediate shipment. We can also quote you attractive prices on your special requirements.

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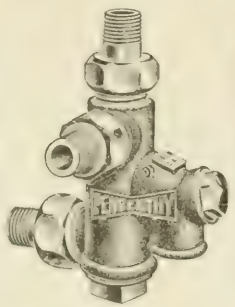
AND FURNACE COKE. FOUNDRY, FORGE
AND BESSEMER PIG IRON
LEETONIA, - - - OHIO.

PENBERTHY

AUTOMATIC INJECTOR

RE-STARTING



SELF-DRAINING

These injectors have the most simple construction possible for practical operation—a turn of the steam valve starts them. After which no attention is necessary.

Penberthy Automatic Injectors are Re-starting, that is, should the current of water to the injector for any reason be stopped or broken, the injector will again pick up the water and re-establish the current to the boiler automatically.

The sale of over 650,000 Penberthy Automatics, or quadruple that of any other injector, assures you of their superiority and the satisfaction which they give their users.

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U. S. A.

UNITED STATES Cast Iron Pipe & Foundry Company.

OPERATING 11 PLANTS.

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Bell and Spigot Specials. Flanged Specials. Flanged Pipe. Flexible Joint Pipe.

We have had ten years experience as a crane building firm and over twenty years as individuals—constantly studying to improve crane design and construction. We have added again and again to our plant and can give you the best to be found in crane practice. Ask about our patent Type E. Electric traveling crane.

"You will search in vain for a better Crane" Ask Users

NORTHERN CRANES!

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SELF SUPPORTING STEEL STACKS
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Steel Works, Rolling Mills, Blast Furnaces, Hot Blast Stoves, Etc. Furnaces for All Purposes.

Gas Producers For Fuel and Power Applied for All Purposes.

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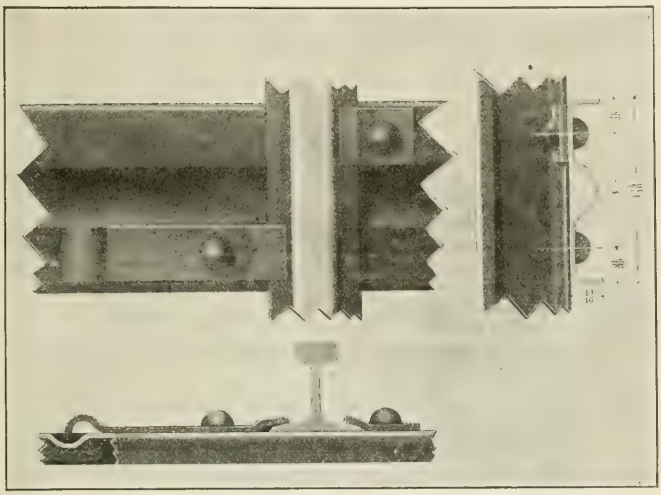
GENERAL OFFICES, PITTSBURGH, PA.



STEEL CROSS TIES

are cheaper than wood when the advantages are carefully considered.

Send us your inquiries.

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Hall Steam Pump Co. .....Pittsburgh
Mesta Machine Co. .....Pittsburgh

AIR HOISTS.
Baird Machinery Co.....Pittsburgh
Northern Eng. Works ...Detroit, Mich.

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Meehan Boiler & Con. Co..Lowellville,O.
National Tube Company .....Pittsburgh
Riter-Conley Mfg. Co. .....Pittsburgh

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Aluminum Co. of America...Pittsburgh

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Standard Bridge Tool Co.....Pittsburgh

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Knox Pressed & Welded Steel Company .....Pittsburgh

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AXLES.
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Carnegie Steel Company .....Pittsburgh
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Link-Belt Company .....Philadelphia

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(Sprues and Risers off Castings.)
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.....Buffalo, N. Y.

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Jeffrey Manufacturing Co..Columbus, O.

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McKeefrey & Co. .....Leetonia, O.
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COKE CHARGING CARS.
Jeffrey Manufacturing Co..Columbus, O.

COLD DRAWN STEEL SHAFTING AND SHAPES.
Jones & Laughlin Steel Co....Pittsburgh
Standard Gauge Steel Company
.....Beaver Falls, Pa.

COLUMNS.
Jones & Laughlin Steel Co....Pittsburgh
Meehan Boiler & Con. Co..Lowellville, O.
W. N. Kratzer & Co. .....Pittsburgh

CONCRETE MIXERS.
Standard Scale & Supply Co...Pittsburgh

CONCRETE REINFORCEMENT.
The Consolidated Expanded Metal Co.'s .....Pittsburgh

CONDENSERS.
Mesta Machine Company ....Pittsburgh
Southwark Foundry & Machine Company .....Philadelphia

CONNECTING RODS.
Standard Gauge Steel Company
.....Beaver Falls, Pa.

CONSULTING ENGINEERS.
Doubleday-Hill Electric Co..Pittsburgh.
Duff, Samuel E. .....Pittsburgh
Kennedy, Julian .....Pittsburgh
Laughlin, Alex & Co. .....Pittsburgh
Schlieper-Daae Company.....Pittsburgh
Standard Bridge Tool Co.....Pittsburgh
The S. R. Smythe Co. .....Pittsburgh
Wm. Swindell & Bros. .....Pittsburgh

CONTRACTORS.
Geo. J. Hagan .....Pittsburgh
Schlieper-Daae Company.....Pittsburgh
The S. R. Smythe Co. .....Pittsburgh
Wm. Swindell & Bros. .....Pittsburgh

CONTROLLERS (Electric.)
Cutler-Hammer Mfg. Co.....Milwaukee
Otis Elevator Company .....Pittsburgh
Doubleday-Hill Electric Co..Pittsburgh.

CONVEYORS AND ELEVATORS.
C. O. Bartlett & Snow Co.....Cleveland
Jeffrey Manufacturing Co..Columbus, O.
Link-Belt Company .....Philadelphia

CONVEYORS (Belt.)
Jeffrey Manufacturing Co..Columbus, O.
Link-Belt Company .....Philadelphia

CONVEYORS (Flight.)
Jeffrey Manufacturing Co..Columbus, O.
Link-Belt Company .....Philadelphia

CONVEYORS (Screw.)
Jeffrey Manufacturing Co..Columbus, O.
Link-Belt Company .....Philadelphia

CONVEYING MACHINERY.
Jeffrey Manufacturing Co..Columbus, O.
Link-Belt Company .....Philadelphia

CORRUGATED IRON.
McCollough Iron Co..Wilmington, Del.

COUPLINGS.
National Tube Company .....Pittsburgh

COUPLINGS (Magnetic.)
Cutler-Hammer Mfg. Co.....Milwaukee

COUPLINGS (Wrought.)
National Tube Company .....Pittsburgh
Central Tube Co. .....Pittsburgh

CRANES.
Northern Eng. Works ...Detroit, Mich.

CRANE CONTROLLERS.
Cutler-Hammer Mfg. Co.....Milwaukee

CRANES—LOCOMOTIVE.
Brown Hoisting Mach. Co...Cleveland
H. J. Koontz .....Pittsburgh
Jeffrey Manufacturing Co..Columbus, O.
Link-Belt Company .....Philadelphia

CRANES & HOISTING MACHINERY
Baird Machinery Co.....Pittsburgh
H. J. Koontz .....Pittsburgh
Jeffrey Manufacturing Co..Columbus, O.
Link-Belt Company .....Philadelphia
Northern Eng. Works ...Detroit, Mich.

CRANK SHAFTS.
Standard Gauge Steel Company
.....Beaver Falls, Pa.

CRANE UNLOADERS.
Jeffrey Manufacturing Co..Columbus, O.
Link-Belt Company .....Philadelphia

CRUCIBLE STEEL.
Wm. Jessop & Sons, Ltd.....New York

CRUCIBLE STEEL MELTING FURNACES.
Wm. Swindell & Bros. .....Pittsburgh

CUPOLA.
Northern Eng. Works ...Detroit, Mich.
Riter-Conley Mfg. Co. .....Pittsburgh

CUPOLA BLOCKS.
Dover Fire Brick Co.....Cleveland, O.
Stowe-Fuller Co. .....Cleveland, O.
United Fire Brick Co...Uniontown, Pa.
West Va. Fire Clay Mfg. Co..Pittsburgh

CUPOLA LININGS.
Dover Fire Brick Co.....Cleveland, O.
Stowe-Fuller Co. .....Cleveland, O.

CYLINDERS.
Mesta Machine Company ....Pittsburgh

DIE BLOCKS.
Heppenstall Forge & Knife Company .....Pittsburgh

DIRECT MOTOR DRIVES.
Crocker-Wheeler Co.....Ampere, N. J.

DISC BRAKES.
Cutler-Hammer Mfg. Co.....Milwaukee

DITCHERS.
Jeffrey Manufacturing Co..Columbus, O.

DREDGE CHAINS.
Jeffrey Manufacturing Co..Columbus, O.
Link-Belt Company .....Philadelphia

DREDGES.
Jeffrey Manufacturing Co..Columbus, O.
Link-Belt Company .....Philadelphia

DREDGING MACHINERY.
C. O. Bartlett & Snow Co.....Cleveland
Jeffrey Manufacturing Co..Columbus, O.

DRILLS.
Jeffrey Manufacturing Co..Columbus, O.

DRILLS FOR COAL MINES.
Jeffrey Manufacturing Co..Columbus, O.

DRIVE CHAINS.
Jeffrey Manufacturing Co..Columbus, O.
Link-Belt Company .....Philadelphia

DRIVE WELL POINTS AND WELL SUPPLIES.
National Tube Company .....Pittsburgh

DOVETAIL ROLLS.
The Heinle Company .....Pittsburgh

DROP HAMMERS.
Chambersburg Engineering Company .....Chambersburg, Pa.

DYNAMO BRUSHES.
Cutler-Hammer Mfg. Co.....Milwaukee
Doubleday-Hill Electric Co..Pittsburgh.

DYNAMOS AND MOTORS.
Crocker-Wheeler Co.....Ampere, N. J.
H. J. Koontz .....Pittsburgh
Doubleday-Hill Electric Co..Pittsburgh.

ELECTRIC HOISTS.
Northern Eng. Works ...Detroit, Mich.
Otis Elevator Company .....Pittsburgh

ELECTRIC LIGHTING MACHIN'RY
Crocker-Wheeler Co.....Ampere, N. J.
Southwark Foundry & Machine Company .....Philadelphia

ELECTRICAL REPAIRS.
Doubleday-Hill Electric Co..Pittsburgh.

ELECTRIC LAMPS (Arc and Incandescent)
Doubleday-Hill Electric Co..Pittsburgh.

ELECTRIC LOCOMOTIVES.
Jeffrey Manufacturing Co..Columbus, O.
Northern Eng. Works ...Detroit, Mich.

ELECTRICAL SUPPLIES.
Doubleday-Hill Electric Company .... Pittsburgh, Pa.

ELEVATOR CONTROLLERS AND ACCESSORIES.
Cutler-Hammer Mfg. Co.....Milwaukee

ELEVATORS.
Jeffrey Manufacturing Co..Columbus, O.
Link-Belt Company .....Philadelphia
Northern Eng. Works ...Detroit, Mich.
Otis Elevator Company .....Pittsburgh

EMERY & CORUNDUM WHEELS.
Standard Scale & Supply Co...Pittsburgh

ENGINEERS.
Chambersburg Engineering Company .....Chambersburg, Pa.
Chester & Fleming .....Pittsburgh, Pa.
Duff, Samuel E. .....Pittsburgh
G. W. McClure Son & Co....Pittsburgh
Jeffrey Manufacturing Co..Columbus, O.
Kennedy, Julian .....Pittsburgh
Laughlin, Alex & Co. .....Pittsburgh
Link-Belt Company .....Philadelphia
Morgan Construction Company..... .....Worcester, Mass.
The S. R. Smythe Co. .....Pittsburgh
Schlieper-Daae Company.....Pittsburgh
United Eng. & Fdry Co.....Pittsburgh
Wm. Swindell & Bros. .....Pittsburgh

ENGINEERS—INSPECTING.
Gulick-Henderson Co. .....Pittsburgh

ENGINEERS—LABORATORY.
Gulick-Henderson Co. .....Pittsburgh

ENGINEERS (Mechanical.)
Schlieper-Daae Company.....Pittsburgh
Jeffrey Manufacturing Co..Columbus, O.
Link-Belt Company .....Philadelphia

ENGINES.
Oswald, R. W. .....Pittsburgh
Otis Elevator Company .....Pittsburgh

ENGINES (Steam.)
Connellsville Mfg. & Mine Supply Company .....Connellsville, Pa.
H. J. Koontz .....Pittsburgh
Mackintosh, Hemphill & Co...Pittsburgh
Mesta Machine Company ....Pittsburgh
Southwark Foundry & Machine Company .....Philadelphia

EQUALIZING GEARS.
Jeffrey Manufacturing Co..Columbus, O.
Link-Belt Company .....Philadelphia

EXPANDED METAL.
The Consolidated Expanded Metal Co.'s .....Pittsburgh

EXPANSION METAL.
National Tube Company .....Pittsburgh

FAN REGULATORS.
Cutler-Hammer Mfg. Co.....Milwaukee

FEED WATER HEATERS, FILTERS AND PURIFIERS.
H. J. Koontz .....Pittsburgh

FIELD REGULATORS.
Cutler-Hammer Mfg. Co.....Milwaukee

FIRE ARCH BRICK.
Dover Fire Brick Co.....Cleveland, O.
Kier Fire Brick Company ....Pittsburgh
Bickford Fire Brick Company..... .....Curwensville, Pa.
Stowe-Fuller Co. .....Cleveland, O.

FIRE BRICK AND CLAY.
Bickford Fire Brick Company..... .....Curwensville, Pa.
Clearfield Fire Brick Co...Clearfield, Pa.
Dover Fire Brick Co.....Cleveland, O.
Kier Fire Brick Company ....Pittsburgh
Pittsburgh-Buffalo Co. .....Pittsburgh
Jos. Soisson Brick Co..Connellsville, Pa.
Sandy Ridge Fire Brick Company .....Sandy Ridge, Pa.
Stowe-Fuller Co. .....Cleveland, O.
United Fire Brick Co...Uniontown, Pa.
West Va. Fire Clay Mfg. Co..Pittsburgh

FIRE ESCAPES.
W. N. Kratzer & Co. .....Pittsburgh

FIRE PROOFING.
W. N. Kratzer & Co. .....Pittsburgh

FIRE PUMP STARTERS.
Cutler-Hammer Mfg. Co.....Milwaukee

FITTINGS.
National Tube Company .....Pittsburgh

FITTINGS (Malleable and Cast Iron.)
National Tube Company .....Pittsburgh

FLAG STAFFS.
National Tube Company .....Pittsburgh

FLANGES (Cast and Malleable.)
National Tube Company .....Pittsburgh

FLATS.
Standard Gauge Steel Company .....Beaver Falls, Pa.

FLANGING CLAMPS.
Chambersburg Engineering Company .....Chambersburg, Pa.
Standard Bridge Tool Co.....Pittsburgh

FLANGING.
Knox Pressed & Welded Steel Company .....Pittsburgh

FINISHED MACHINE KEYS.
Standard Gauge Steel Company .....Beaver Falls, Pa.

FLIGHT CONVEYORS.
Jeffrey Manufacturing Co..Columbus, O.
Link-Belt Company .....Philadelphia

FLOAT SWITCHES.
Cutler-Hammer Mfg. Co.....Milwaukee

FORGE AND FURNACE LININGS.
Bickford Fire Brick Company..... .....Curwensville, Pa.

FORGINGS.
Carnegie Steel Company .....Pittsburgh
Heppenstall Forge & Knife Company .....Pittsburgh
Jeffrey Manufacturing Co..Columbus, O.
Mesta Machine Company ....Pittsburgh
W. N. Kratzer & Co. .....Pittsburgh

FORGINGS PRESSES.
Chambersburg Engineering Company .....Chambersburg, Pa.
Mesta Machine Co. .....Pittsburgh
United Eng. & Fdry Co.....Pittsburgh

FOUNDRY EQUIPMENTS.
Baird Machinery Co.....Pittsburgh
Meehan Boiler & Con. Co..Lowellville,O.

FOUNDRY FIRE BRICK.
Bickford Fire Brick Company..... .....Curwensville, Pa.
Dover Fire Brick Co.....Cleveland, O.
Kier Fire Brick Company ....Pittsburgh
Stowe-Fuller Co. .....Cleveland, O.

FRICTION CLUTCHES.
Jeffrey Manufacturing Co..Columbus, O.
Link-Belt Company .....Philadelphia

FURNACES.
American Stoker Co. .....New York

FURNACE BUILDERS.
Laughlin, Alex & Co. .....Pittsburgh
Geo. J. Hagan .....Pittsburgh
G. W. McClure Son & Co....Pittsburgh
Kennedy, Julian .....Pittsburgh
Morgan Construction Company..... .....Worcester, Mass.
Schlieper-Daae Company.....Pittsburgh
The S. R. Smythe Co. .....Pittsburgh
Wm. Swindell & Bros. .....Pittsburgh

GALVANIZED SHEETS.
McCollough Iron Co..Wilmington, Del.

GAS AND GASOLINE ENGINES.
Standard Scale & Supply Co...Pittsburgh

GAS-CLEANING PLANTS.
The Smith Gas Power Co..Lexington, O.

GAS ENGINES.
Mesta Machine Company ....Pittsburgh

GAS PRODUCERS.

Geo. J. Hagan .....Pittsburgh
Laughlin, Alex & Co. .....Pittsburgh.
Morgan Construction Company.....
.....Worcester, Mass.
Riter-Conley Mfg. Co. .....Pittsburgh
Schlieper-Daae Company.....Pittsburgh
The S. R. Smythe Co. .....Pittsburgh
The Smith Gas Power Co..Lexington, O.
Wm. Swindell & Bros. .....Pittsburgh

GATE VALVES.

National Tube Company .....Pittsburgh

GEARING (Bevel, Mitre, Spur, etc.)

Link-Belt Company .....Philadelphia

GEARS.

Jeffrey Manufacturing Co..Columbus, O.
Mesta Machine Company ....Pittsburgh

GENERATORS.

Crocker-Wheeler Co.....Ampere, N. J.
Doubleday-Hill Electric Co..Pittsburgh.

GERMAN SILVER

Shimer & Company, Inc.....Pittsburgh

GIRDERS.

DeMoines Bridge & Iron Company
..... DeMoines, Ia.

Jones & Laughlin Steel Co....Pittsburgh
Meehan Boiler & Con. Co..Lowellville,O.
W. N. Kratzer & Co. .....Pittsburgh

GLOBE VALVES.

National Tube Company .....Pittsburgh

GRAB BUCKETS.

Jeffrey Manufacturing Co..Columbus, O.

GRATES.

American Stoker Co. .....New York

GRAIN TANKS.

Standard Steel Tank & Manufacturing Company .....Pittsburgh, Pa.

GROUND FIRE CLAY.

West Va. Fire Clay Mfg. Co..Pittsburgh

GUILLOTINE SHEARS.

Standard Bridge Tool Co.....Pittsburgh

HEAD FRAMES.

Riter-Conley Mfg. Co. .....Pittsburgh

HIGH SPEED PUNCHES.

Standard Bridge Tool Co.....Pittsburgh

HOISTING ENGINES.

Otis Elevator Company .....Pittsburgh

HORIZONTAL DRILLS.

Baird Machinery Co.....Pittsburgh

HORIZONTAL PUNCHES.

Standard Bridge Tool Co.....Pittsburgh

HOT BLAST STOVE BRICK.

Stowe-Fuller Co. .....Cleveland, O.

HOT BLAST STOVES.

Bickford Fire Brick Company.....
.....Curwensville, Pa.
G. W. McClure Son & Co....Pittsburgh

HOT METAL CARS.

Meehan Boiler & Con. Co..Lowellville,O.

HYDRAULIC ENGINEERS.

Chester & Fleming .....Pittsburgh, Pa.

HYDRAULIC MACHINERY.

Baird Machinery Co.....Pittsburgh
Chambersburg Engineering Company .....Chambersburg, Pa.
Mesta Machine Company ....Pittsburgh

HYDRAULIC PUMPS.

Chambersburg Engineering Company .....Chambersburg, Pa.

HYDRAULIC VALVES AND FITTINGS.

Chambersburg Engineering Company .....Chambersburg, Pa.
National Tube Company .....Pittsburgh

INJECTORS—AUTOMATIC.

Penberthy Injector Co. ..Detroit, Mich.

ICE TOOLS.

Standard Scale & Supply Co...Pittsburgh

IGNITION BATTERY RHEOSTATS.

Cutler-Hammer Mfg. Co.....Milwaukee

INDUSTRIAL RAILWAYS.

Link-Belt Company .....Philadelphia

INSPECTION.

The Heinle Company .....Pittsburgh
Gulick-Henderson Co. .....Pittsburgh

IRON AND STEEL BARS.

Jones & Laughlin Steel Co....Pittsburgh

IRON FENCING.

W. N. Kratzer & Co. .....Pittsburgh

IRON ROOFS AND BUILDINGS.

Riter-Conley Mfg. Co. .....Pittsburgh
W. N. Kratzer & Co. .....Pittsburgh

"KEWANEE" UNIONS & SPECIALTIES.

National Tube Company .....Pittsburgh

LADLES.

Knox Pressed & Welded Steel Company .....Pittsburgh
Meehan Boiler & Con. Co..Lowellville,O.

LADLE BRICK.

West Va. Fire Clay Mfg. Co..Pittsburgh

LADLE LININGS.

Dover Fire Brick Co.....Cleveland, O.
Stowe-Fuller Co. .....Cleveland, O.

LATHES.

Baird Machinery Co.....Pittsburgh

LIFTING MAGNETS.

Cutler-Hammer Mfg. Co.....Milwaukee

LIMIT SWITCHES.

Cutler-Hammer Mfg. Co.....Milwaukee

LINK-BELTING.

Jeffrey Manufacturing Co..Columbus, O.
Link-Belt Company .....Philadelphia

LOCOMOTIVE CRANES.

Industrial Works .....Bay City, Mich.
Link-Belt Company .....Philadelphia

LOCOMOTIVE FIRE BRICK

Bickford Fire Brick Company.....
.....Curwensville, Pa.
Dover Fire Brick Co.....Cleveland, O.
Stowe-Fuller Co. .....Cleveland, O.

MACHINE BOLTS.

Riter-Conley Mfg. Co. .....Pittsburgh

MACHINE RACK.

Standard Gauge Steel Company
.....Beaver Falls, Pa.

MACHINE TOOLS.

Baird Machinery Co.....Pittsburgh
H. J. Koontz .....Pittsburgh.

MACHINERY CASTINGS.

Wm. Swindell & Bros. .....Pittsburgh

MAGNESIA BRICK.

Stowe-Fuller Co. .....Cleveland, O.

MAGNESITE.

Stowe-Fuller Co. .....Cleveland, O.

MAGNETIC CLUTCHES.

Cutler-Hammer Mfg. Co.....Milwaukee

MAGNETIC SEPARATORS.

Cutler-Hammer Mfg. Co.....Milwaukee

MAGNETIC (Electric Lifting.)

Cutler-Hammer Mfg. Co.....Milwaukee

MALLEABLE CASTINGS.

Jeffrey Manufacturing Co..Columbus, O.
Link-Belt Company .....Philadelphia

MASTER SWITCHES.

Cutler-Hammer Mfg. Co.....Milwaukee

MAXIMUM SILENT CHAIN.

Link-Belt Company .....Philadelphia

METAL CONFORMATION.

The Heinle Company .....Pittsburgh

METALLURGISTTS.

Gulick-Henderson Co. .....Pittsburgh

MILLING MACHINES.

Baird Machinery Co.....Pittsburgh
Standard Bridge Tool Co.....Pittsburgh

MINE FANS.

Jeffrey Manufacturing Co..Columbus, O.

MINING MACHINERY & SUPPLIES.

C. O. Bartlett & Snow Co.....Cleveland
Connellsville Mfg. & Mine Supply Company .....Connellsville, Pa.
Doubleday-Hill Electric Co..Pittsburgh.
Jeffrey Manufacturing Co..Columbus, O.
Meehan Boiler & Con. Co..Lowellville,O.
Phillips Mine & Mill Supply Company .....Pittsburgh

MOTORS.

Crocker-Wheeler Co.....Ampere, N. J.
Doubleday-Hill Electric Co..Pittsburgh.

MONEL METAL.

Shimer & Company, Inc.....Pittsburgh

MULTIPLE PUNCHES.

Standard Bridge Tool Co.....Pittsburgh

OIL REFINERY WORK.
Standard Steel Tank & Manufacturing Company .....Pittsburgh, Pa

ORE CARS.
Jeffrey Manufacturing Co..Columbus, O.

ORE CONCENTRATORS & SEPARATORS.
McLanahan Stone Machine Company .....Hollidaysburg, Pa.

ORE HANDLING MACHINERY.
C. O. Bartlett & Snow Co.....Cleveland
Jeffrey Manufacturing Co..Columbus, O.
Link-Belt Company .....Philadelphia

OXYGEN.
The Linde Air Products Co....Buffalo

OXY-ACETYLENE WELDING AND CUTTING APPARATUS.
The Linde Air Products Co....Buffalo

PATENTS.
J. M. Nesbit .....Pittsburgh
Siggers & Siggers..Washington, D. C.

PAVING BRICK.
West Va. Fire Clay Mfg. Co..Pittsburgh

PAVING BLOCK.
West Va. Fire Clay Mfg. Co..Pittsburgh

"PECK" CARRIERS.
Link-Belt Company .....Philadelphia

PENSTOCKS.
Riter-Conley Mfg. Co. .....Pittsburgh
Standard Steel Tank & Manufacturing Company .....Pittsburgh, Pa.
Knox Pressed & Welded Steel Company .....Pittsburgh

PHOSPHOR BRONZE.
Shimer & Company, Inc.....Pittsburgh

PIG METALS (ORES, etc.)
McKeefrey & Co. ....Leetonia, O.

PIG IRON.
Shimer & Company, Inc.....Pittsburgh

PILLAR CRANES.
Industrial Works .....Bay City, Mich.
Northern Eng. Works ...Detroit, Mich.

PIPE AND PIPE FITTINGS.
Central Tube Co. .....Pittsburgh
National Tube Company .....Pittsburgh
U. S. Cast Iron & Pipe Foundry Company .....Scottdale, Pa.

PIPE COILS.
National Tube Company .....Pittsburgh

PIPES (Riveted Steel).
Riter-Conley Mfg. Co. .....Pittsburgh

PLATE WORK.
Knox Pressed & Welded Steel Company .....Pittsburgh
Meehan Boiler & Con. Co..Lowellville,O.
Riter-Conley Mfg. Co. .....Pittsburgh
Standard Steel Tank & Manufacturing Company .....Pittsburgh, Pa.

POLES (Tubing Steel.)
National Tube Company ....Pittsburgh

POWER PLANTS.
Doubleday-Hill Electric Co..Pittsburgh.
Mesta Machine Company ....Pittsburgh

PNEUMATIC TOOLS.
Connellsville Mfg. & Mine Supply Company .....Connellsville, Pa.
H. J. Koontz .....Pittsburgh.

PRESSES—DRILL AND DROP.
Baird Machinery Co.....Pittsburgh

PRESSURE REGULATORS.
Cutler-Hammer Mfg. Co.....Milwaukee

PULLEYS AND CLUTCHES.
Baird Machinery Co.....Pittsburgh
Jeffrey Manufacturing Co..Columbus, O.
Jones & Laughlin Steel Co....Pittsburgh
Link-Belt Company .....Philadelphia
Mesta Machine Company ....Pittsburgh

PUMP CONTROLLERS.
Cutler-Hammer Mfg. Co.....Milwaukee

PUMPS.
Hall Steam Pump Co. .....Pittsburgh
Mesta Machine Company ....Pittsburgh

PUNCHES.
Standard Bridge Tool Co.....Pittsburgh
United Eng. & Fdry Co.....Pittsburgh

QUARRY MACHINERY.
Connellsville Mfg. & Mine Supply Company .....Connellsville, Pa.
Jeffrey Manufacturing Co..Columbus, O.
Link-Belt Company .....Philadelphia
Phillips Mine & Mill Supply Company .....Pittsburgh

RADIAL DRILLS.
Standard Bridge Tool Co.....Pittsburgh

RADIATORS.
National Tube Company .....Pittsburgh

RADIATORS (Staggered Tube-Wrought).
National Tube Company .....Pittsburgh

RECIPROCATING CONVEYORS.
Jeffrey Manufacturing Co..Columbus, O.
Link-Belt Company .....Philadelphia

RECORDING GAS CALORIMETERS.
The Smith Gas Power Co..Lexington, O.

RELAYING RAILS.
Richardson Company .....Pittsburgh

REMOTE CONTROL APPARATUS.
Cutler-Hammer Mfg. Co.....Milwaukee
Doubleday-Hill Electric Co..Pittsburgh.

REPAIRING CASTINGS.
Linde Air Products Co., The..... .....Buffalo, N. Y.

REPAIRING LOCOMOTIVES.
Linde Air Products Co., The..... .....Buffalo, N. Y.

RESISTANCE GRIDS.
Cutler-Hammer Mfg. Co.....Milwaukee

RESISTANCE UNITS.
Cutler-Hammer Mfg. Co.....Milwaukee

REVERSE CLUTCHES.
Bessemer Gas Engine Company .....Grove City, Pa.

REVERSING ENGINES.
Mesta Machine Company ....Pittsburgh
Otis Elevator Company .....Pittsburgh

REVERSING FURNACE VALVES.
Wm. Swindell & Bros. .....Pittsburgh

RIVETED PIPE.
Meehan Boiler & Con. Co..Lowellville,O.
Knox Pressed & Welded Steel Company .....Pittsburgh

RIVETED WATER PIPE.
Standard Steel Tank & Manufacturing Company .....Pittsburgh, Pa.

RIVETERS.
Baird Machinery Co.....Pittsburgh
Chambersburg Engineering Company .....Chambersburg, Pa.
Standard Bridge Tool Co.....Pittsburgh

RIVETTING.
Linde Air Products Co., The..... .....Buffalo, N. Y.

ROLL ALTERNATORS.
The Heinle Company .....Pittsburgh

ROLL DESIGNERS.
The Heinle Company .....Pittsburgh
Mesta Machine Co. .....Pittsburgh
Seaman Sleeth Co.....Pittsburgh, Pa.
United Eng. & Fdry Co.....Pittsburgh

ROLL LATHES.
Mesta Machine Company ....Pittsburgh
United Eng. & Fdry Co.....Pittsburgh

ROLLING MILL MACHINERY.
Crocker-Wheeler Co.....Ampere, N. J.
Heppenstall Forge & Knife Company .....Pittsburgh
Jeffrey Manufacturing Co..Columbus, O.
Mackintosh, Hemphill & Co...Pittsburgh
Mesta Machine Company ....Pittsburgh
Morgan Construction Company..... .....Worcester, Mass.
Philips & McLaren Co. .....Pittsburgh
Seaman Sleeth Co.....Pittsburgh, Pa.
United Eng. & Fdry Co.....Pittsburgh
Wheeling Mould & Fdry. Co...Wheeling

ROLL TURNERS.
The Heinle Company .....Pittsburgh

ROLL TURNING TOOLS.
Heppenstall Forge & Knife Company .....Pittsburgh
Samuel Trethewey & Co. ....Pittsburgh
Seaman Sleeth Co.....Pittsburgh, Pa.

ROOF TRUSSES.
W. N. Kratzer & Co. .....Pittsburgh

ROPE COATING.
C. O. Bartlett & Snow Co.....Cleveland

ROPE TRANSMISSION.
C. O. Bartlett & Snow Co.....Cleveland
Jeffrey Manufacturing Co..Columbus, O.
Jones & Laughlin Steel Co....Pittsburgh
Link-Belt Company .....Philadelphia
Mesta Machine Company ....Pittsburgh

SAND.
Shimer & Company, Inc.....Pittsburgh

SAND HANDLING MACHINERY.
Jeffrey Manufacturing Co..Columbus, O.
Link-Belt Company .....Philadelphia

SANITARY ENGINEERS.
Chester & Fleming .....Pittsburgh, Pa.

SCALES.
Fairbanks Co., The .....Pittsburgh
Standard Scale & Supply Co...Pittsburgh

SCRAP METAL.
Koehler & Streng .....Pittsburgh

SCREENS.
C. O. Bartlett & Snow Co.....Cleveland
Connellsville Mfg. & Mine Supply Company .....Connellsville, Pa.

SCREW STOCK.
Standard Gauge Steel Company .....Beaver Falls, Pa.

SECOND HAND MACHINERY.
Baird Machinery Co.....Pittsburgh
H. J. Koontz .....Pittsburgh.

SEWER PIPE AND FLUE LININGS
West Va. Fire Clay Mfg. Co..Pittsburgh

SELF STARTERS.
Cutler-Hammer Mfg. Co.....Milwaukee

SHEARS.
Mesta Machine Company ....Pittsburgh
Philips & McLaren Co. .....Pittsburgh
Wheeling Mould & Fdry. Co...Wheeling

SHEAVE WHEELS.
Link-Belt Company .....Philadelphia

SHEET IRON AND STEEL.
McCullough Iron Co...Wilmington, Del.

SHELBY SEAMLESS STEEL MECHANICAL TUBING.
National Tube Company .....Pittsburgh

SILICA BRICK.
Kier Fire Brick Company ....Pittsburgh
Stowe-Fuller Co. .....Cleveland, O.
United Fire Brick Co...Uniontown, Pa.

SNAP SWITCHES.
Cutler-Hammer Mfg. Co.....Milwaukee
Doubleday-Hill Electric Co..Pittsburgh.

SOLENOIDS.
Cutler-Hammer Mfg. Co.....Milwaukee
Doubleday-Hill Electric Co..Pittsburgh.

SOLENOID SWITCHES.
Cutler-Hammer Mfg. Co.....Milwaukee

SOLID STEEL SHEAR KNIVES.
Samuel Trethewey & Co. ....Pittsburgh
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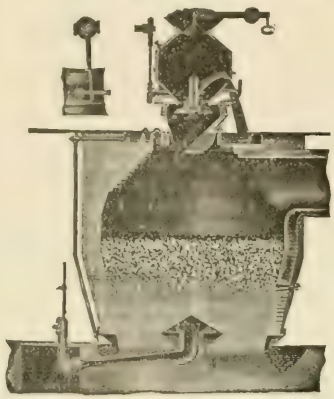

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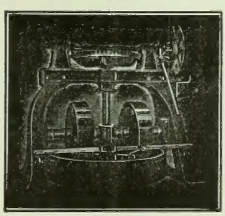

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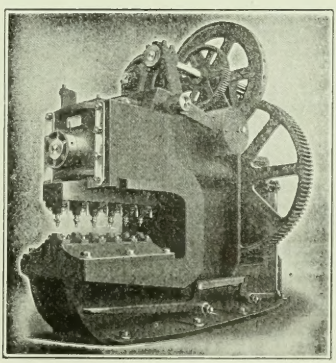

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